



November 2013

Lactarius Notebook 15

L. R. Hesler

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LACTARIUS FRAGILIS (Burl.) stat. nov.

On soil, grassy woods trail, Pink Beds, N. C., August 1, 1907, leg.

Burlingham, No. 33

Type

Spores 6-8 x 6-7.5(8) μ , ellipsoid to subglobose, warts 0.3-0.6 μ (0.8) μ high, a few isolated, with broad and medium narrow bands and branches forming a partial to nearly complete reticulum. Basidia 33-42 x 9-10 μ , 2-4-spored. Pleurocystidia none found; pseudocystidia 2-4 μ broad, filamentous, rarely forked, with refractive contents; cheilocystidia 18-27 x 2.5-4 μ , inconspicuous, cylindric, flask-shaped, clavate, apices tapering, or capitate to rounded. Gill trama of narrow subparallel hyphae. Pileus trama vesiculose. Pileus cuticle of inflated cells and rarely hyphal fragments, bearing scattered or gregarious pileocystidia, 14-27 x 3-7 μ , clavate, cylindric, occasionally capitate. Stipe cuticle of repent, narrow hyphae, bearing caulocystidia 20-37 x 3-5 μ , cylindric, clavate, ventricose, scattered or in small tufts; rosettes none. Clamp connections none.

This subspecies differs from Lactarius camphoratus in several respects, ~~in several~~

LACTARIUS ~~CAMPHORATUS~~ Subsp. FRAGILIS (Burl.) *stat. nov.*

On soil, grassy woods trail, Pink Beds, N.C., August 1, 1907, leg.

Burlingham, No. 33.

Type

Mem. Torr. Club 14:99. 1908.

Spores 6-8 x 6-7.5(8) μ , ellipsoid to subglobose, warts 0.3-0.6 μ high, with broad and medium narrow bands forming a reticulum, no fine lines and no isolated warts. Basidia 33-42 x 9-10 μ , 2-4-spored. Pleurocystidia none found; pseudocystidia 25-37 x 3-5 μ , filamentous, rarely forked, with refractive contents; cheilocystidia 18-27 x 2.5-4 μ , inconspicuous, cylindric, flask-shaped, clavate, apices tapering or capitate or rounded. Gill trama vesiculose (interwoven hyphae and cells). Pileus trama vesiculose. Cuticle a zone of cells, bearing scattered or gregarious pileocystidia, 14-27 x 3-7 μ , clavate, cylindric, occasionally capitate. Caulocystidia 20-37 x 3-5 μ , cylindric, clavate, ventricose, scattered or in small tufts. Clamp connections none.

This subspecies differs from Lactarius camphoratus in several respects, as follows: It has the odor (fresh and dry) of the typical species, but the latex is watery, gills less crowded and maize-yellow, cap disc rugose and margin crenate and somewhat sulcate; pleurocystidia none; spores more nearly globose and with broad bands forming a reticulum.

Lactarius camphoratus subsp. *fragilis* ^{stat. nov.?} sp. nov.

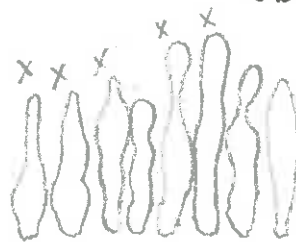
Type



Pileus cuticle
x 1000



Pseudo-
x 1000



Ch - x 1000



Spore - x 8000



Pileus cuticle with pilei - x 1000



Caulis - x 1000

1415

35242

LACTARIUS FRAGILIS

PHOTO

On soil and deep humus, deciduous woods, Ramsey Cascade,

GSMNP, leg. David Jenkins, June 15, 1971

Pileus 3-4 cm broad, plano-convex and slightly depressed, at first "snuff brown," then "clay color," with a blackish, low umbo or umbo obsolete, glabrous, even. Context pallid brownish; odor more or less aromatic. Latex watery to whey-like, unchanging, not copious, taste slightly astringent, not staining.

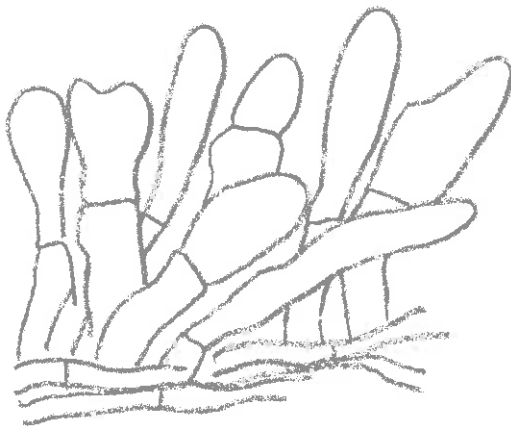
Lamellae adnate-subdecurrent, "pinkish cinnamon" then "cinnamon buff" to yellowish, nearly distant at first then subdistant, medium broad, lamellulae of 4-5 ranks.

Stipe 6-8 cm long, 4-6 mm thick (apex) and 6-9 (base), enlarged downward, apex concolorous with pileus, darker downward, fragile, hollow, glabrous except white-strigose base.

Spores in deposit: white, 5.5-7.5(8) x 5.5-7(7.5) μ , globose, to broadly ellipsoid, warts (variable) 0.2-0.5(1.0) μ , bands forming a partial to more or less complete reticulum. Pleurocystidia none; pseudocystidia filamentous; cheilocystidia 24-32 x 4-6 μ , subclavate. Pileus cuticle of cells and hyphal fragments (camphoratus type). Stipe cuticle of repent hyphae, bearing caulocystidia which are matted-down; rosettes present. Clamp connections none.

Rastarius fragilis (Burl.) stat. nov.

35242



Caule x 1000

Tenn-35404

Thiers - 7572

LACTARIUS ~~PHRAGMOCYSTIDIOSUS~~ sp. nov.

fragilis (Burl.) stat. nov. var. *fragilis*

In humus, mixed woods, near Mill Valley, California,

March 6, 1960

Notes by Thiers (supplemented)

Pileus 1.5-2.5 cm broad, sayal brown or snuff brown, dry, glabrous, margin even. Latex whey-like, unchanging, not staining, taste mild, odor aromatic of (fenugreek in the dried material).

close or subdistant, medium broad,
Lamellae/subdecurved, warm buff.

Stipe 1.5-2.5 cm x 3-5 mm, concolorous with pileus, glabrous.

Notes by Hesler

Spores 7-8.5(9) x 6-7(7.5) μ , ellipsoid to broadly so, at times subglobose, warts 0.2-0.4 μ high, bands forming a partial reticulum. Basidia 48-56 x 9-11 μ , 4-spored. Pleurocystidia none; pseudocystidia filamentous; cheilocystidia 25-46 x 4-8 μ , cylindric, clavate, or subfusoid, usually 1-septate. Gill trama of short-celled, subparallel hyphae. Pileus trama vesiculose. Pileus cuticle a brownish zone of irregular cells, sometimes forming slight mounds, the zone 35-80 μ thick, bearing occasional pileocystidia, resting on an hypodermium. Stipe of repent hyphae, bearing scattered caulocystidia.

The latex characters, pileus-cuticle structure, the

Tenn-35404
Thiers-7572

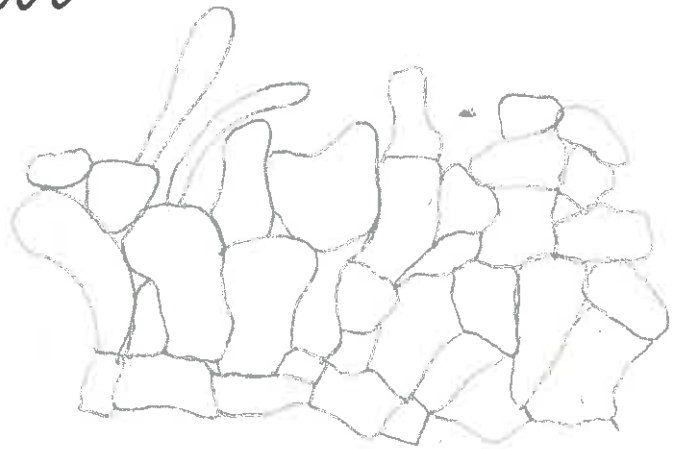
fragilis var. *fragilis*
L. ~~phragmocystidiosus~~ - 2

odor, and the septate cheilocystidia are the distinguishing features of this species. It is near L. serifluus which has pyriform cheilocystidia, and its pileus is dark-red paling to brown-olive-gray, and rugulose; and warts 0.3-1.0 μ . It is also near L. cremor in which the pileus is slightly viscid, the margin plicate-crenate, and smaller spores (6.5-7.5 x 6-6.8 μ).

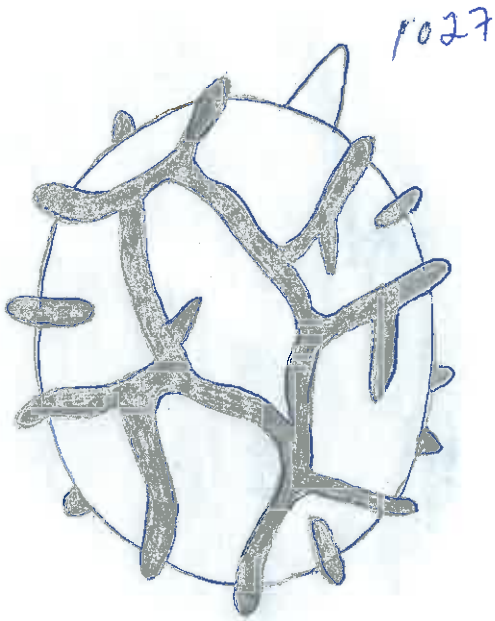
Factarium fragilis v. *fragilis*
~~*fragilis*~~ *sp. nov.*
 Thiers - 7572 (= Tenn 35404)



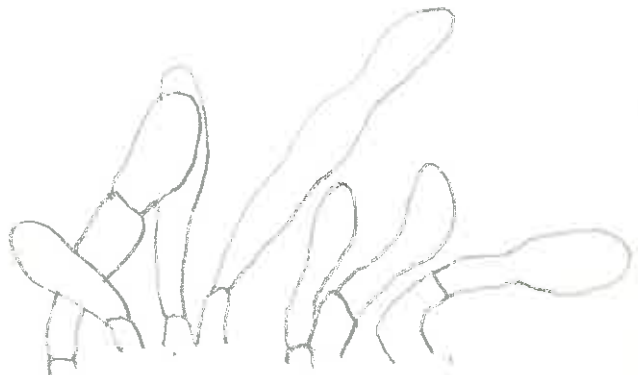
ch. $\times 1000$



Pileus outicle $\times 1000$



Spore - $\times 8000$



Step - canulo $\times 1000$

35705

LACTARIUS ~~RUBIDUS~~ sp. nov.

fragilis (Burl.) stat. nov. var. *fragilis*

In deep humus, under beech, Hesler's, Knox Co., August 25, 1970

Pileus 2-3 cm broad, plano-convex, depressed, hygrophanous, when wet "Hay's Russett" to "Prussian red," when dry "pinkish cinnamon," not viscid, smooth when young, becoming ~~lacerated and~~ ^{and lacerated} areolate at maturity ~~(best seen under lens)~~, margin wavy-crenate, often short-striate.

Context concolor; odor aromatic. Latex watery, soon more or less whey-like, ^{taste} mild.

Lamellae adnate-decurrent, close, narrow, "light pinkish cinnamon" at first, finally "orange cinnamon," lamellulae alternating.

Stipe 3-4 cm long, 2-3 mm thick, "pinkish cinnamon," tubular, ^{dry, glabrous}

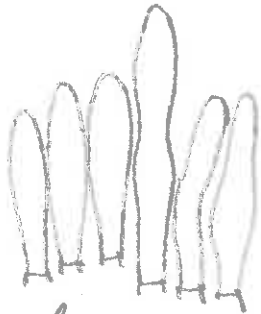
Spores in deposit: "pale ochraceous buff" to "light ochraceous buff," depending on intensity; ~~spores~~ 6-8 x 5-7 μ , globose, subglobose or ellipsoid, warts 0.3-0.7 μ , bands and branches forming a partial reticulum. Basidia 38-46 x 7-8 μ , 4-spored. Pleurocystidia none; cheilocystidia 23-37 x 4-6 μ , inconspicuous, subfusoid, ventricose, or subcylindric. Gill trama of short-celled, interwoven to subparallel hyphae. Pileus cuticle dry, of the rimosellus-type: surface hyphal cells become inflated and ventricose, pyriform to vesiculose, and form numerous mounds. Pileus trama with rosettes. Stipe cuticle of perpendicular, repent hyphae; rosettes present. Clamp connections none.

The hygrophanous, red (wet) to pinkish cinnamon (dry) depressed, lacerated, areolate pileus; the aromatic odor; the watery then whey-like, mild latex; the lack of pleurocystidia, the spore-ornamentation; and rimosellus-type pileus-cuticle are distinctive characters.

Spore-ornamentation separates it from L. rimosellus which it resembles.

Lactarius fragilis (Burl.) st. nov. var. *fragilis*
~~*pubescens* sp. nov.~~

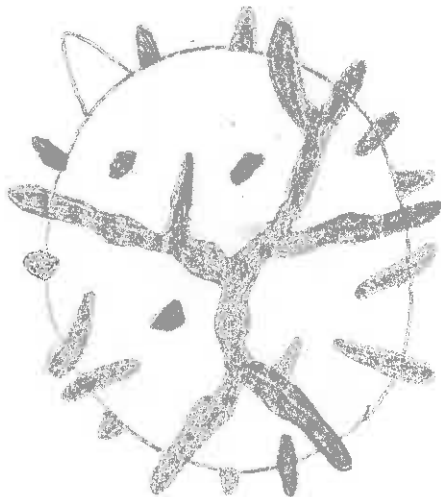
35705



ch. - x 1000



Pileus cuticle
x 1000



Spore -
x 8000

(~~Tenn-32234~~
Sm-80093

~~fragilis~~
LACTARIUS RUBIDUS ^{var.} sp. nov.

Corridor, Polk County, Oregon, November 18, 1970 (Smith says see

Card-79713)

Micro features essentially as in Sm-79713.

fragilis var.

Sm-79713

LACTARIUS RUBIDUS ^{var.} sp. nov. C-PHOTO

Gregarious on rotting wood, Corridor, Polk County, Oregon,
November 9, 1970

Notes by Smith

Pileus 3-5 cm broad, convex with an incurved margin, soon plane or shallowly depressed, typically lacking an umbo, margin opaque when moist, often irregular in outline, "Kaiser brown" on disc, "ferruginous" on margin, dry, surface not rimulose-areolate but typically rugose-wrinkled, rarely weakly striatulate. Context thin, distinctly brittle; odor and taste not distinctive, becoming aromatic when dried. Latex watery to whey-like, unchanging, mild.

Lamellae broadly adnate becoming decurrent, near "pale pinkish cinnamon," becoming darker "pinkish cinnamon," edges soon stained darker pinkish cinnamon, subdistant, medium broad, lamellulae frequent, often forking.

Stipe 2-4 cm long, 3-6 mm thick, concolorous, or vinaceous-tawny, base darker, fragile, hollow, base strigose.

Notes by Hesler

Spores "pale pinkish buff," 6-8.5 x 6-8 μ , globose to subglobose, warts 0.2-0.4 μ high, bands and branches forming a partial reticulum. Basidia 44-53 x 9-11 μ , 4-spored. Pleurocystidia none; pseudocystidia filamentous, 2-3 μ broad; cheilocystidia 20-25 x 3-7 μ , cylindric to subclavate, clustered, often inconspicuous. Gill trama of short-celled, interwoven hyphae. Pileus cuticle of hyphal fragments

Sm-79713

fragilis var.
L. ₁ rubidus - page 2

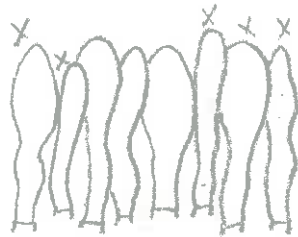
intermixed with small and large cells forming an epithelium, some surface cells with pileocystidia, other cells become loosened. Stipe cuticle similar, with caulocystidia; rosettes present. Clamp connections none.

Pactarimus fragilis var. *rubellus* var. nov.
~~*Pactarimus rubellus* sp. nov.~~

Sm - 79713



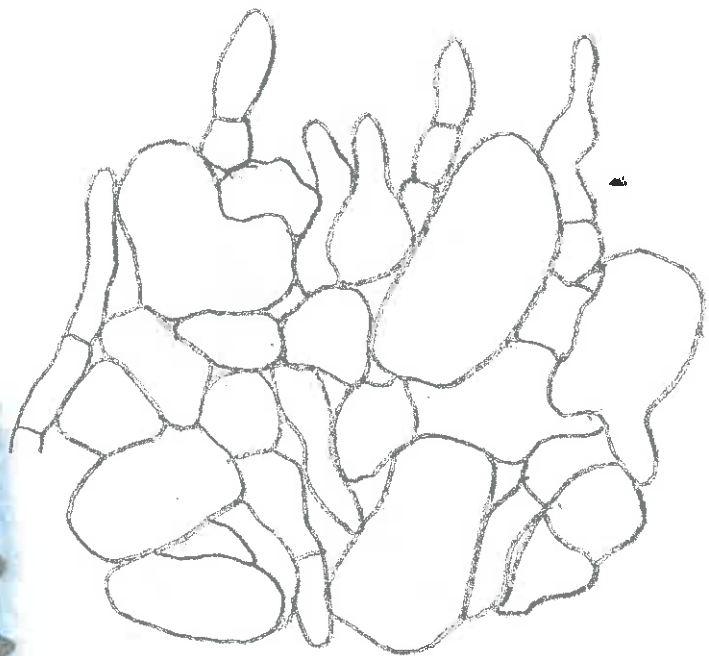
Pseudo: $\times 1000$



Ch $\times 1000$



Spore $\times 8000$



1043 Pileus cuticle $\times 1000$
[see stipe cuticle: Sm - 79942]

Sm-79938

fragili
LACTARIUS RUBIDUS ^{var.} sp. nov.

C-PHOTO

Gregarious on very rotten conifer wood, Van Dugar Corridor, Polk County,
Oregon, November 14, 1970 (L. helvus - group)

Notes by Smith

Pileus 2-3.5 cm broad, convex-depressed, in age shallowly depressed with a spreading margin, "burnt sienna" to "Sanford's brown," becoming paler "cinnamon rufus," and finally "apricot buff" on margin, glabrous, hygrophanous, margin wavy-crenate in age, often rugulose, granulose under lens. Context very thin, brittle, concolor; odor and taste mild. FeSO_4 - 0; KOH - 0 (on cuticle). Latex whey-like to watery, mild.

Lamellae broadly adnate, dull "light pinkish cinnamon," then darker, weakly spotted orange-buff, subdistant at maturity, medium broad, lamellulae frequent, often forked and anastomosing.

Stipe 4-9 cm long, 5-10(12) mm thick, concolor, or redder at base, equal, hollow, dry, dull, fragile, weakly strigose at base.

Spores in deposit: pale pinkish buff.

Notes by Hesler

All micro characters as in other L. rubidus collections.

Odor of dried specimens aromatic (more or less fenugreek).

Sm-79939

fragilis
LACTARIUS RUBIDUS ^{var}~~sp.~~ nov.
1

Van Dugar Corridor, Polk County, Oregon, November 14, 1970 (see Card -
Smith 79938).

Micro characters as in 79938.

Sm-79940

fragilis var.
LACTARIUS RUBIDUS ~~sp.~~ ^{var.} nov.

(CARD: 79938)

On rotten wood, Polk Co., Oregon, November 14, 1970

Notes by Hesler

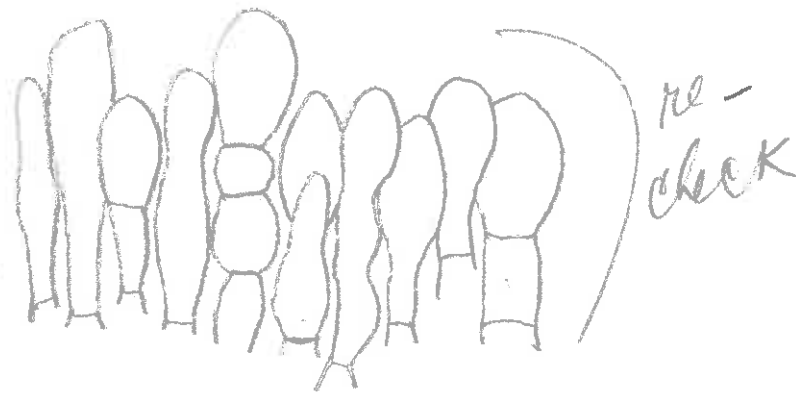
Spores 7.5-9.5 x 7-8.5 μ , globose, subglobose, or broadly ellipsoid, warts 0.2-0.4 μ , bands and branches forming a partial reticulum. Pleurocystidia none found; cheilocystidia 24-43 x 4-8(12) μ , clavate ventricose, often septate below, compactly arranged. Pileus cuticle a zone 150-240 μ thick, of irregularly-shaped cells; hypodermium brown. Stipe cuticle of perpendicular hyphae, of variable size; caulocystidia at times present; rosettes present.

Odor (dried) aromatic, of fenugreek.

Cf. cheilocystidia with those of L. phragmocystidiosus.

Saccarium fragilis var. *rubidus* var. nov.
~~*Saccarium rubidus* sp. nov.~~

Sm-79940



re-
check

ch. x 1000

Sm-79941

Fragilis
LACTARIUS RUBIDUS ^{var} sp. nov.

Polk County, Oregon, November 14, 1970 (see Card-79938).

Odor of dried material aromatic - fenugreek.

Micro features as in Sm-79938.

Sm-79942

fragilis var.
LACTARIUS RUBIDUS var. nov.

On rotten wood~~s~~, Van Dugar Corridor, Polk County, Oregon, November 14,
1970 (helvus-group). see Card-79938

Same as Sm-79938 in micro characters. -

Type

20956

Frustriatus
LACTARIUS BRUNNEOZONATUS sp. nov.

Under rhododendron, Highlands, North Carolina, July 20, 1953.

Pileus 5-8 cm broad, hemispherical, finally expanding slightly depressed, viscid, zonate, zones alternately "avellaneous" and "snuff brown," with a pinkish-gray tint, disc darker, glabrous, margin striatulate. Context thick on disc, elsewhere thin, pallid then pinkish; odor slightly aromatic, taste slight. Latex white, soon pale-yellow, sparse, mild.

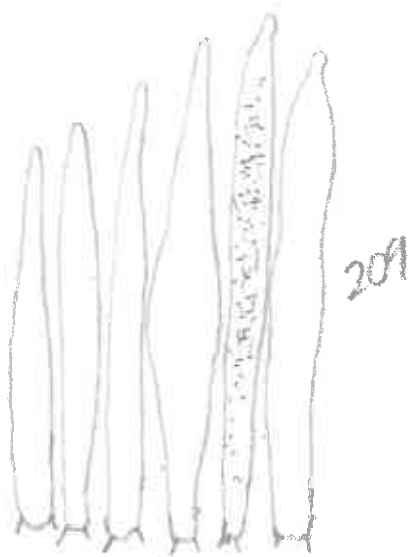
Lamellae adnate-decurrent, white then pallid, ~~when~~ stained pinkish, rather narrow, somewhat forked, close, venose.

Stipe 4-9 cm long, 5-10 mm thick, equal or tapering above or ventricose, at times base clavate, ^{with} concolor ~~to~~ pileus, glabrous, dry, solid then spongy.

Spores 7-9 x 5.5-7 μ , ellipsoid to nearly subglobose, warts 0.4-1.0 μ high, with bands and lines forming a partial reticulum. Basidia 36-40 x 7-8 μ , 4-spored. Pleurocystidia 52-70 x 5-9 μ , subcylindric to ventricose, apices tapering, granular-spangled; cheilocystidia 25-34 x 3-7 μ , more or less fusoid, granular-spangled. Gill trama of short-celled, subparallel hyphae. Pileus trama vesiculose. Pileus cuticle an ixocutis, resting on a hypoderm. Stipe cuticle of repent, dry hyphae; rosettes present. Clamp connections none.

This species is near L. vinaceorufescens var. fallax, in which, however, the pileus is buff to pinkish cinnamon, the odor mild, the latex is bitter becoming acrid, and the pleurocystidia larger.

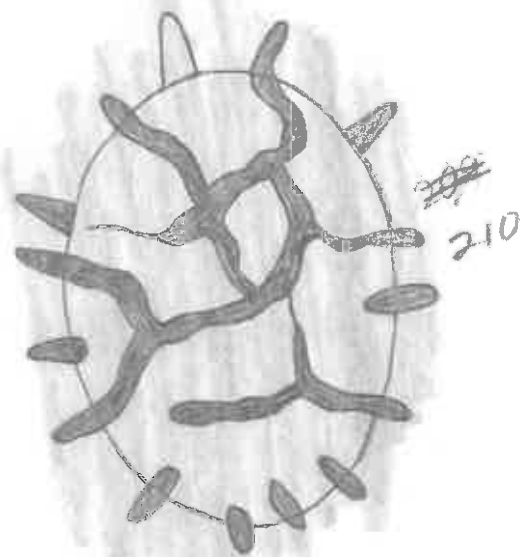
Rastarius frustulatus sp. nov.
20956



Pl. - x 1000



Ch. - x 1000



Spore - x 8000

Tenn-35500
Cooke - 41712

frustratus sp. nov.
LACTARIUS ~~CALACTUS~~ sp. nov.

On sandy soil, Hocking County, Ohio, October 5, 1969

Notes by Cooke

Pileus 5-7 cm broad, convex to deeply depressed, reddish brown, viscid, azonate or obscurely zonate, glabrous, margin even. Latex watery-white, acrid-bitterish (alum-like), staining ~~the~~ the gills darker where bruised.

Lamellae subdecurrent, white becoming tawny, staining darker where bruised, narrow, close.

Stipe 5-7 cm long, 7-10 mm thick, concolorous with the pileus, dry, solid, equal, not spotted.

Notes by Hesler

Spores ivory whitish in deposit, 6-8.5 x 5.5-7 μ , ellipsoid, sterigmal appendage inconspicuous, warts 0.4-1.0 μ , a few isolated, bands with branches forming a partial reticulum. Basidia 36-42 x 7-9 μ , 4-spored. Pleurocystidia 50-74 x 4-6 μ , slender-fusoid or subventricose, acuminate; cheilocystidia 28-40 x 5-6 μ , similar. Gill trama of undulating, subparallel hyphae. Pileus trama vesiculose. Pileus cuticle an ixocutis; hypodermium brownish. Stipe cuticle of dry, repent, perpendicularly disposed hyphae, with scattered, cylindric caulocystidia; rosettes present. Clamp connections none.

This is distinguished from its near relatives (L. mutabilis, erythrocephalus, and subhibbardae) by its watery-white latex, reddish-brown pileus, and its brown-staining lamellae.

Factarium frustratus
galactus sp. nov.

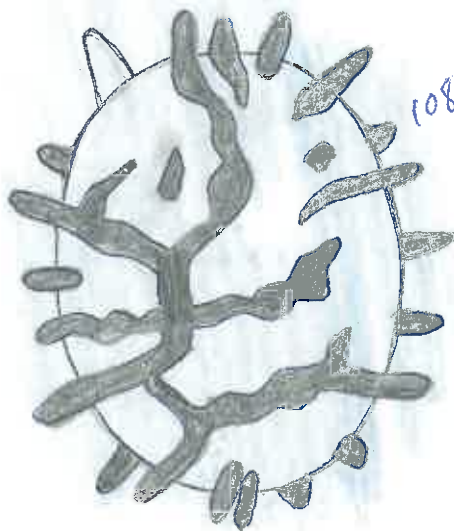
Cooke - 41712
(Tenn - 35500)



Pl. - x 1000



ch - x 1000



Spore -
x 8000

35644

Penstemon sp. nov.
LACTARIUS ~~PSEUDO-ISABELLIVUS~~ sp. nov.

PHOTO (not good)

On soil, deciduous-hemlock woods, Crib Gap, Cades Cove, July 29, 1971

Pileus 3-6 cm, plano-convex, depressed, center dark-brown, elsewhere pale "cinnamon brown," zonate to azonate, viscid, margin thin, margin faintly striate or even. Context pallid, thin; odor slightly aromatic, taste sub-acrid. Latex white, becoming yellow, not staining the gills.

Lamellae adnate, white, then cream, close, medium broad, occasionally forked behind, lamellulae numerous.

Stipe 3.5-6 cm long, 5-9 mm thick, brown (darker downward), dry, spongy, equal, not spotted.

Spores in deposit: "eartridge buff," 6-8 x (5.5)6-7 μ , short-ellipsoid, warts 0.4-0.8(1.0) μ , some isolated, bands and branches forming a partial reticulum. Pleurocystidia 48-60 x 5-9 μ , ventricose-acuminate; cheilocystidia 32-43 x 5-7 μ , similar. Pileus cuticle an ixocutis; hypodermium present. Stipe cuticle of repent, dry hyphae; rosettes present. Clamp connections none.

Sm-64576

LACTARIUS FULIGINELLUS

PHOTO

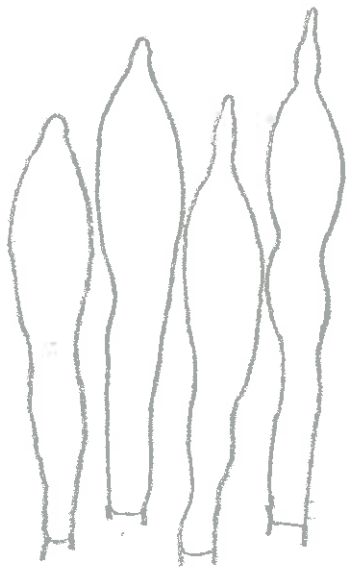
Gorman Lake Woods, Washtenaw Co., Michigan, October 4, 1961

Holotype

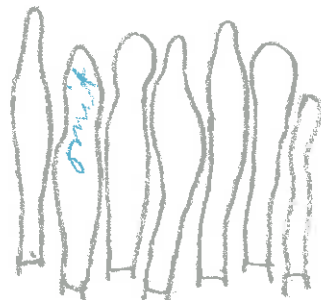
Spores 7.5-9 x 7-8.5 μ , subglobose to globose, warts often blunt and with a broad base, 0.5-1.0 μ high, bands forming a partial to nearly complete reticulum. Basidia 57-68 x 9-11 μ , 4-spored. Pleurocystidia 53-66 x 9-12 μ , clavate-ventricose, more or less mucronate to appendiculate; cheilocystidia 25-36 x 3-6⁽¹¹⁾ μ , cylindric, subclavate, ventricose, often rather inconspicuous. Gill trama subparallel. Pileus trama vesiculose. Pileus cuticle more or less a chain of brown cells, the terminal elements as pileocystidia, 38-60 x 5-12 μ , cylindric, ventricose, clavate, forming a turf, resting on a colorless, subgelatinous zones of interwoven hyphae. Stipe cuticle a turf of caulocystidia, 45-62 x 4-8 μ , clavate, subcylindric, subventricose, often more or less matted down; rosettes present. Clamps none.

Ractarius fuliginellus

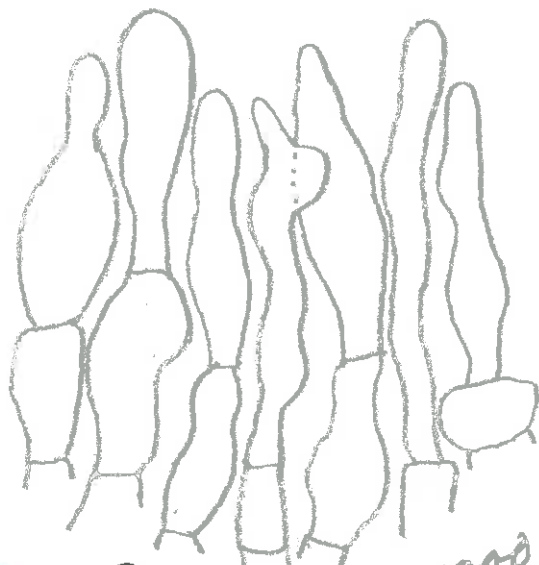
Im-64576 - Holotype



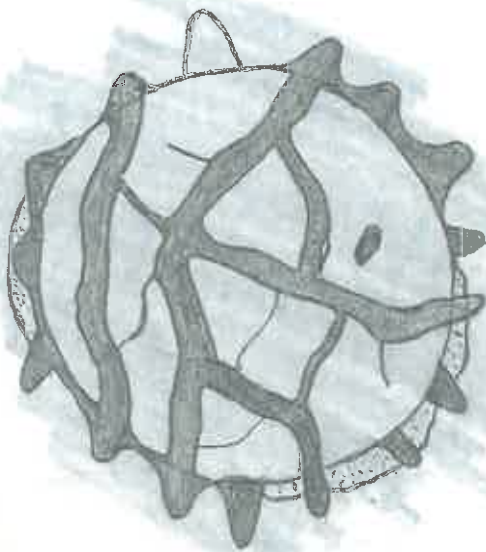
Sp. x 1000



Ch - x 1000



Pileus turf - x 1000



Spore - x 8000



Caule - turf
x 1000

Excluded

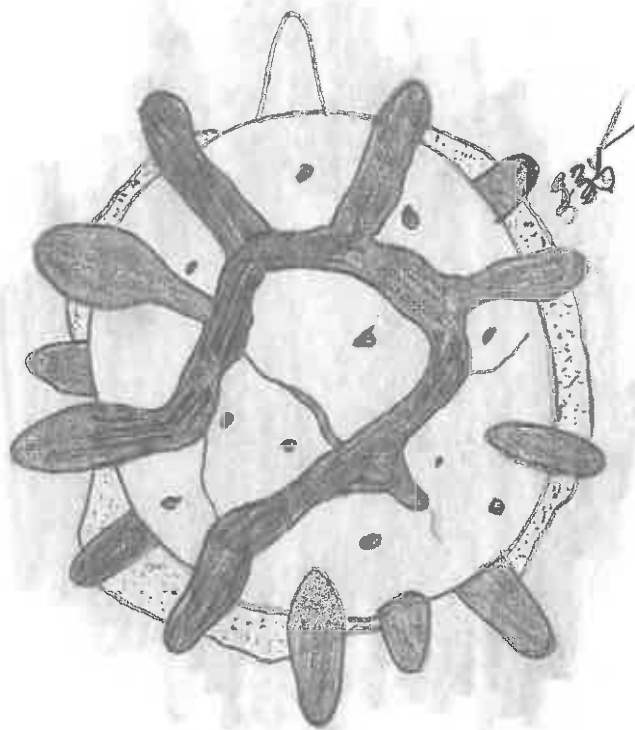
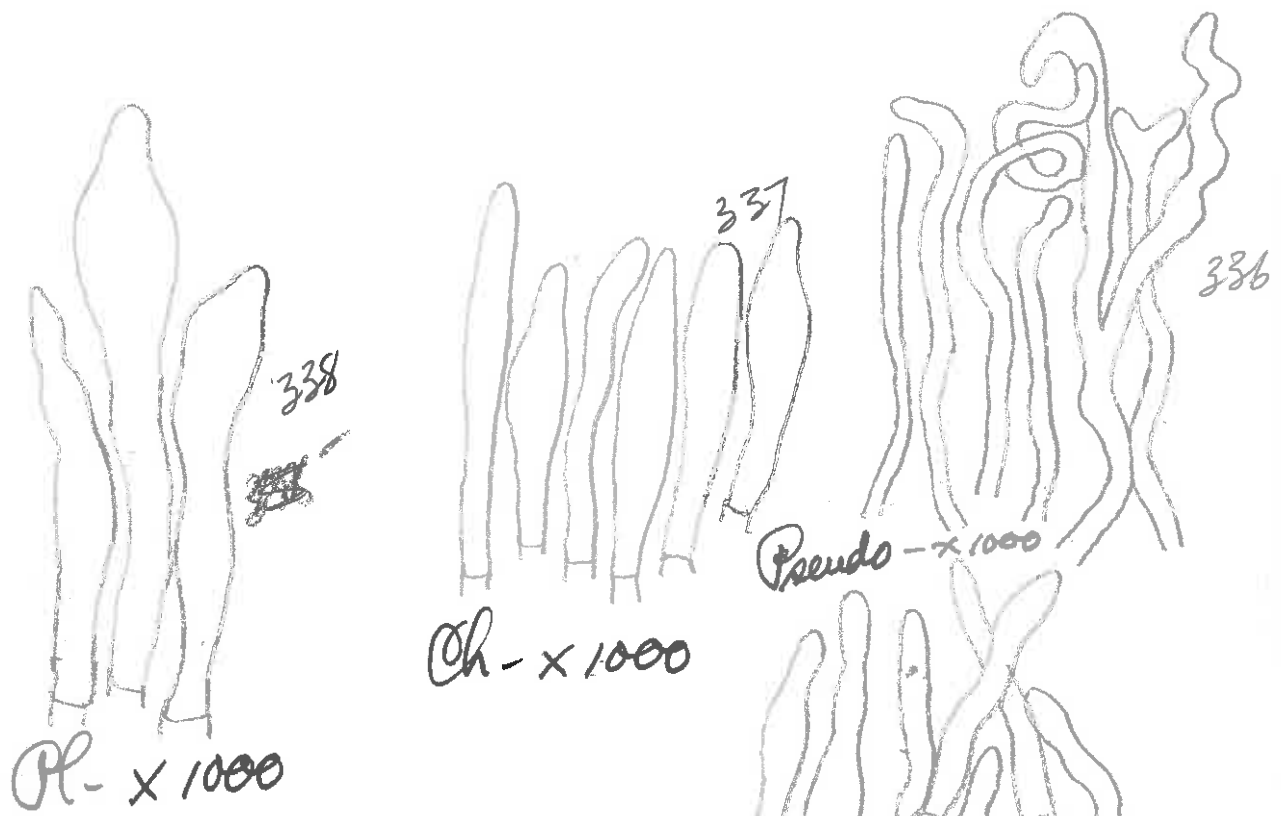
Sm-10041 LACTARIUS FULIGINOSUS var. CLITOCYBOIDES

Newfound Gap, GSMNP, North Carolina, August 11, 1938

Holotype

Spores 8.5-11 x 8-11 μ , globose or subglobose, warts 1.0-2.0 μ high, broad, blunt or conic, bands widely spaced, with a few lines, forming a partial reticulum, webbing present and giving a dingy amyloid reaction. Basidia 52-66 x 10-13 μ , (2)-4-spored. Pleurocystidia 52-70 x 7-14 μ , clavate or subfusoid, rare; pseudocystidia filamentous, often crooked or even coiled, rather abundant, 2-4 μ broad; cheilocystidia 38-52 x 4-8 μ , ventricose, cylindric, subclavate, at times numerous. Gill trama of short-celled, subparallel hyphae. Pileus trama vesiculose. Pileus cuticle a colorless, somewhat gelatinous zone, resting a brownish, hypodermial zone, and ~~the surface~~ ^{bearing with} a turf of pileocystidia, 30-~~60~~⁷⁰ x 4-7 μ , cylindric, ventricose, borne on a chain (2-3) of cells. Stipe cuticle a subgelatinous zone, the surface hyphae bearing caulocystidia, 30-68 x 3-6 μ , cylindric, subventricose, more rarely capitate, only at times forming a turf; rosettes present. Clamp connections present.

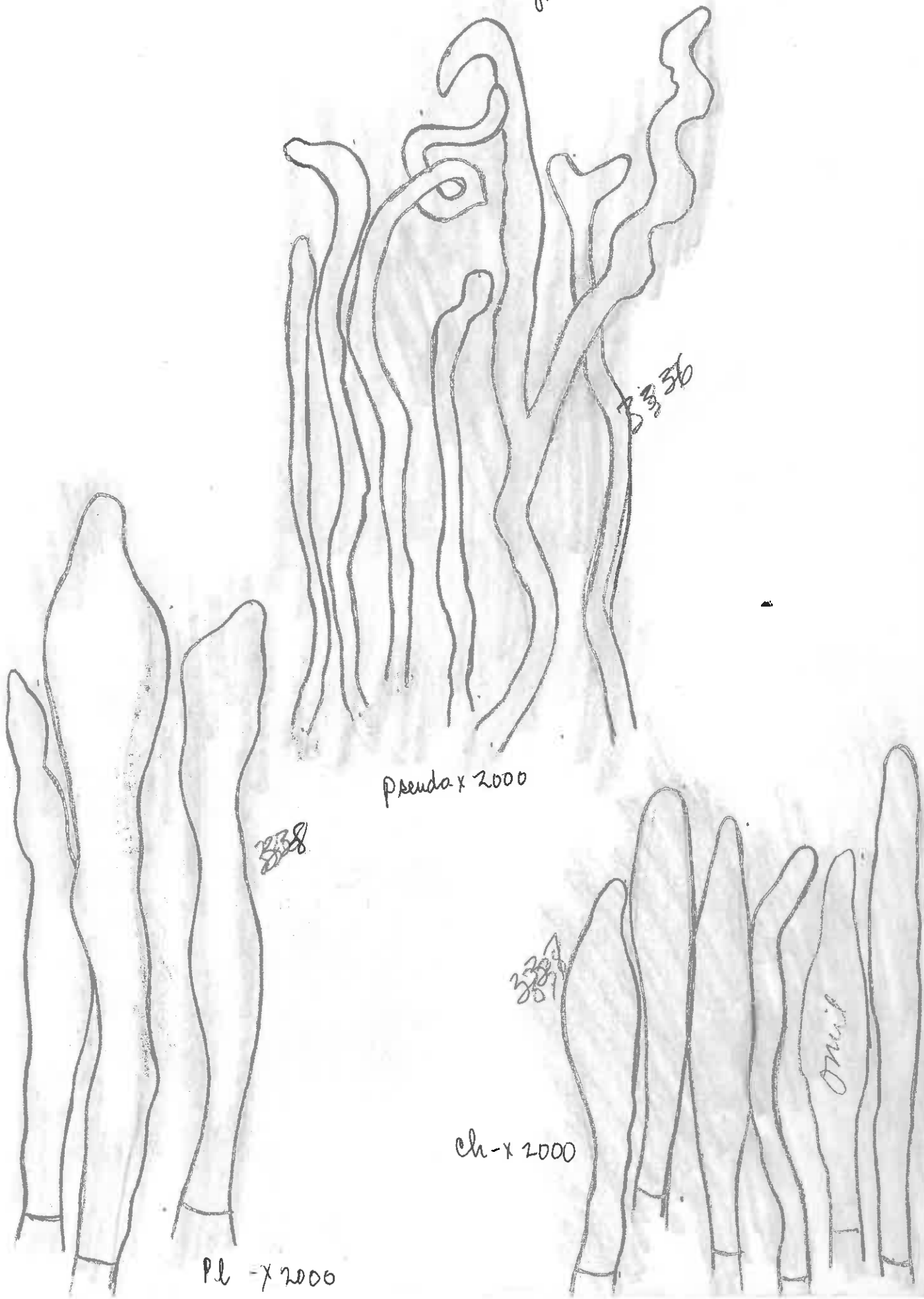
Sactarius fuliginosus var. *clitocyboides*
Sm-10041. Holotype



Spore - x 8000



Lactarius fuliginosus var. *clitocyboides*
Sm - 10041 - Holotype



Ammarati - 359 LACTARIUS FULIGINOSUS var. CLITOCYBOIDES

Trout Lake, Marquette Co., Michigan, August 5, 1968

Notes by Smith

Pileus 58 mm, umbilicate, "Prout's brown," velutinous, margin more or less plane, warm buff. Latex white, unchanging.

Lamellae slightly decurrent, warm buff, ascending, broad, subdistant many forking near the margin, edges not marginate.

Stipe 72 x 13 mm, equal, concolorous, velutinous.

Spore print pinkish vinaceous?

Notes by Hesler

Spores 9-12 x 8-10.5(11) μ , globose or subglobose, warts 1.0-2.3 μ high, with bands and lines forming no reticulum or a partial one. Basidia 52-66 x 10-12 μ , 2-4-spored. Pleurocystidia 50-72 x 10-12 μ , basidioid, apices rounded to appendiculate, granular; pseudocystidia filamentous-crooked; cheilocystidia 42-65 x 5-7 μ , cylindric, subventricose, often 1-3-septate, tinged brownish. Gill trama of small cells. Pileus trama vesiculose; rosettes below. Pileus cuticle of loosely organized brown cells (clavate, flask-shaped, ventricose, irregular) bearing brown terminal elements (pileocystidia) 25-55 x 5-12 forming a loose turf. Stipe cuticle hyphoid, bearing a brown turf of caulocystidia, 26-52 x 4-7 μ , some septate, cylindric, flask-shaped, subventricose; rosettes present. Clamps none.

Differs from var. lignyotus in its having pleurocystidia, decurrent gills.

Factarius fuliginosus var. *clavatus* Boides
fuliginosus var. *fuliginosus* Boides
 Ammirati - 359



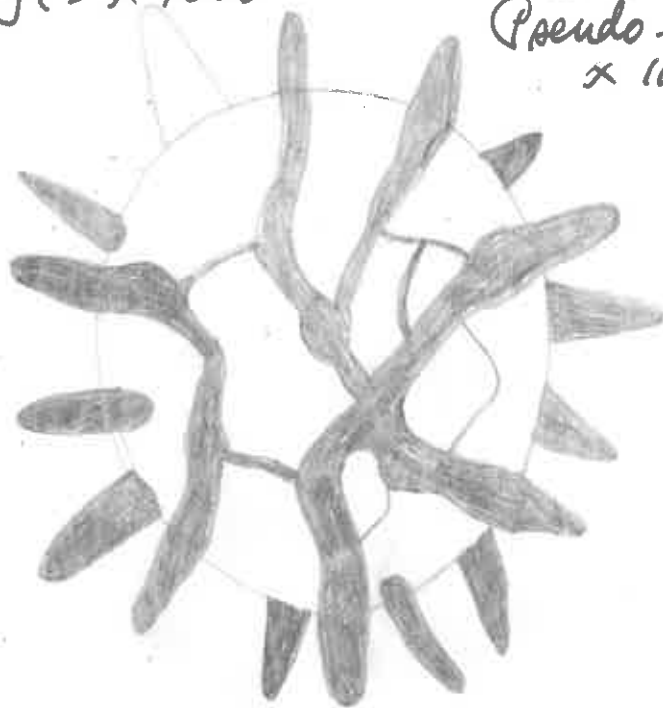
Cl - x 1000



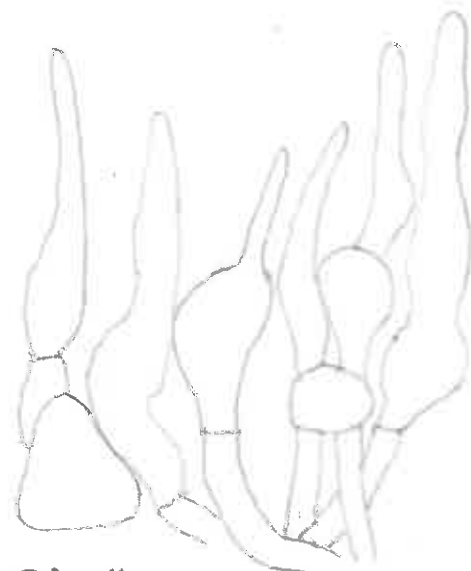
Pseudo -
x 1000



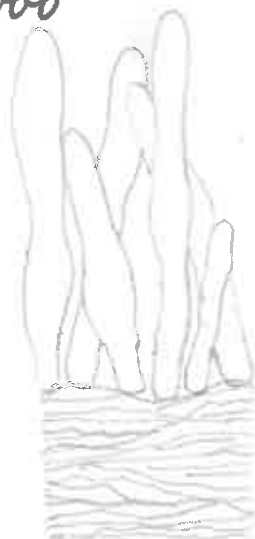
Ch - x 1000



Spore - x 8000



Pileus "turf"



Caulo turf
x 1000

van Waveren

LACTARIUS FULIGINOSUS (Fr.) Fr.

British Isles, Surrey, Wisborough Green, near Chichester, September 4,
1967 (Foray, British Mycol. Soc.).

Notes by van Waveren

Pileus 3.3-4.5 cm, with strongly involute margin, very felty (matted, contrary to slimy), partly brown-grey (M 10 YR 5/2, 4/2), partly paler (M 10 YR, 7/4, 6/4), both coloring intermingling giving the surface a mottled appearance. Odor none. Flesh becoming pinkish red. Latex white, very acrid. ?

Gills pinkish pale-brown, close to nearly so.

Stipe 2.7-3.3 cm long, 11-12 mm thick, base slightly brown, cylindric, white, on bruising showing many small pinkish-orange spots.

Notes by Hesler

Spores 8-9.5 (10) x 7.5-9 (9.5) u, globose or subglobose, warts 0.4-1.0 u high, bands (broad and a few narrow) forming a complete or partial reticulum, isolated warts rare. Basidia 54-67 x 9-11 (12) u, 4-spored. Pleurocystidia none; pseudocystidia none found; cheilocystidia 28-46 x 3-6 u, filamentous, some subventricose or subclavate, rather abundant, extending up the sides 50-80 u. Gill trama of narrow, short-celled, slightly interwoven hyphae. Pileus cuticle a brown epithelial zone, (2-5 cells thick, bearing a turf of colorless cylindric pileocystidia, .20-44 x 3-5 u, which form more or less a turf. Stipe cuticle of interwoven hyphae bearing a turf, with frequent tufts, of colorless caulocystidia, 28-53 x 2-4 u, cylindric, with an occasional septum; rosettes present. Clamps none.

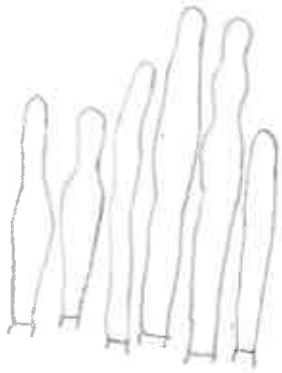
The type-variety of L. fuliginosus is mild then bitter, but not acrid (according to Neuhoff, p. 194, the latex is described as almost mild, later on the tongue and in the throat it is noticeably bitter, but scarcely acrid).

The white stipe and gray-brown cap indicate azonites instead of fuliginosus.

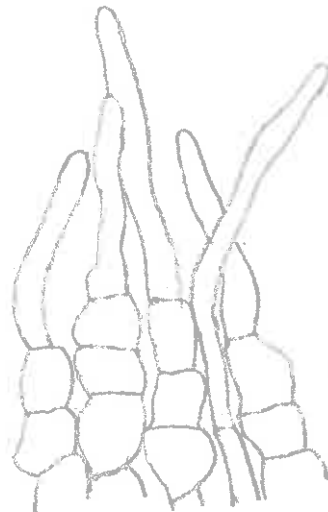
Plectaricus fuliginosus (Fr.) Fr. (?)

van Waveren

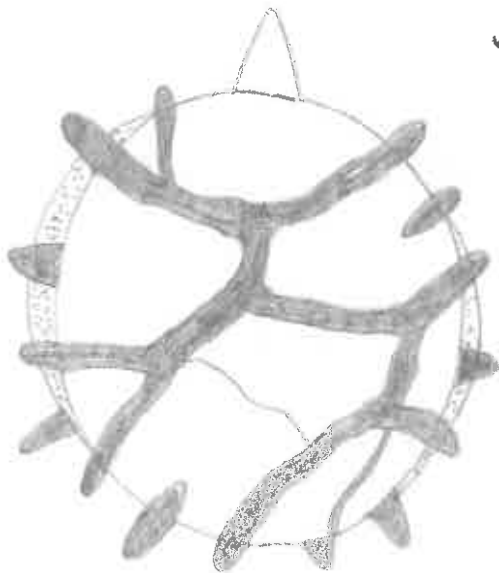
(Surrey, England, Sept 4, 1967)



Ch- x 1000



Pileus - cuticle
x 1000



Spore x 8000



Caulo x 1000

Reynders

LACTARIUS FULIGINOSUS (Fr. ex Fr.) Fr.

Zeist, Wulperhorst, Holland, Reynders, August 23, 1952

Notes by Bas (Transl. by Donk)

In view of the spores this could be azonites.

Notes by Hesler

Spores 8-10 x 8-9 μ , subglobose to globose, warts 0.8-2.0 μ , bands few, wide-spaced, with branches, forming a partial reticulum. Pleurocystidia and cheilocystidia not found. Pileus cuticle a cellular zone, without a turf, only scattered pileocystidia, ~~16-24 x 2-5~~ 16-24 x 2-5 μ , cylindric. Stipe cuticle of hyphae bearing scattered caulocystidia, similar to pileocystidia but longer.

Bas - 1960

^{OK}
LACTARIUS FULIGINOSUS (Fr. ex Fr.) Fr. sensu Neuhoff.

Noord Brabant, Holland, on rich soil, sandy humus, with Corylus and
other deciduous trees, July 19, 1960 (= L. speciosus (Lange)
Romagn.)

Notes by Bas (transl. by Donk)

Pileus 4 cm, convex with a slightly flattened center, margin not incurved, finely pruinose under handlens, faded ocher - brown (Lange 97 comes closest to it; Neuhoff, pl. 11, 44, middle fruit body of L. pterosporus hardly dark enough). Context white, slowly pale flesh-pink in peripheral portion of stalk, and beneath the pellicle of cap, after about 5 minutes, then becoming rusty-brown, then disappearing; taste mild. Latex white at first.

Lamellae adnate, pale ocher yellow with salmon-flesh tinge, where bruised becoming red-brown, then rather close, narrow, thin; narrowed at both ends.

Stalk 4.5 cm x 9 mm, base broader, concolor with cap but paler, base whitish, delicately brown pruinose at slightly fluted apex.

Spores 7.0-7.3 x 6.1- 6.7 u, strongly reticulate.

Notes by Hesler

Spores 8-9.5 x 7.5-8.5 u, warts 0.4-1.0 u, globose to subglobose, bands forming a complete or partial reticulum. Pleurocystidia none; cheilocystidia 30-44 x 3-5 u, cylindric. Pileus cuticle a zone

Bas - 1960

L. fuliginosus - 2

(epithelial) of brown cells (3-5 cells deep), bearing a turf of pileo, 18-50 x 3-5 u. Stipe cuticle of interwoven hyphae, bearing a turf of caulocystidia, 23-54 x 3-5 u; rosettes present. Clamps none.

Essentially, the structures are as in van Waveren. (coll. British Isles, September 4, 1967). The spore measurements by Bas ~~Waveren~~ ~~Waveren~~ ~~Waveren~~ apparently exclude the warts.

Bas-2115 LACTARIUS FULIGINOSUS (Fr.) Fr. sensu Neuhoff

In Picea-Fagus woods, Czechoslovakia, north of Bresno, September 7, 1960

Notes by Bas (Transl. by Donk)

Cap and stalk ocher-fuliginous. Flesh slowly becoming red-stippled. Latex scarce. Gills brownish-cream.

Notes by Hesler

Spores 8.5-10(11) x 7.5-9.5(10.5) μ , warts 0.7-2.0 μ , bands few and wide-spaced, webbing present, no reticulum. Pleurocystidia none; cheilocystidia not found. Pileus cuticle a zone of cells, no turf found. Stipe cuticle of repent hyphae, bearing a sparse turf of caulocystidia.

Material not the best! It appears old.

LACTARIUS FULIGINOSUS Fries var. FULIGINOSUS

Epicr. Syst. Myc. 348. 1838

ILLUSTRATIONS:

Fileus 4.5-9(-12) cm broad, broadly convex at first, seldom umbonate, soon with a depressed disc, in age irregularly broadly vase-shaped but at times almost as regular as the pale-stiped species; edge at first broadly incurved, long remaining sharply decurved, at times distantly sulcate and also with small crenations, wavy in age in large specimens, sometimes lobed; surface dry, velvety-pruinose, becoming naked, dull, smooth (but under a lens punctate-rough), rarely radiate-rugulose over the disc; color dark sooty brown to umber sooty brown, at times leather-color on margin, never black, in age with slight olive tones, at times with dingy ochraceous spots. Context pallid to creamy, soon staining reddish to orange-reddish when injured (especially the cortex of the stipe); odor slight. Latex white, staining context red, scanty in age and somewhat watery, almost mild, later noticeably bitter but hardly acrid.

Lamellae at times very close, mostly clearly distant (reminding one of L. vellereus), lamellulae many tiers; lamellae seldom forked, either narrowed to the stipe or somewhat rounded, often with a short tooth, tapered to the cap margin, moderately broad (3-5 mm), at first yellowish pallid, then cloudy ochre-yellow with buff tones, paler toward the edge, as seen from above with an orange-rusty sheen, dark ochraceous pruinose from spores, reddish where injured.

Stipe 5-10 cm long, 7-20 mm thick, cylindric, often relatively slender, seldom ventricose, mostly slightly narrowed at base and bent,

often slightly compressed and then usually longitudinally grooved, smooth to slightly fluted at apex, solid, stuffed with a pith in age; surface velvety-pruinose like the pileus and about concolorous with it; apex paler and brighter toned, grayish below, base with white mycelium, dull reddish when bruised.

Spore deposit bright ochraceous (F). Spores almost globose 8-9.5 x 8-9 μ ; ornamentation almost lacking any warts but composed of a reticulum of bands over 1 μ high. Basidia 45-54 x 9-11 μ , 4-spored. Macrocystidia none. Cheilocystidia present as scattered hairs 4-5 μ broad, blunt, projecting 15-20 μ .

HABIT, HABITAT, AND DISTRIBUTION - Under hardwoods, especially beech, but in mixed conifer and hardwood forests also, late summer and fall. Europe and North America. Rare in North America, known from New York, North Carolina, and Michigan.

MATERIAL STUDIED - MICHIGAN: Smith 37499, 39482, 57988, 75982; NEW YORK: Smith 266; NORTH CAROLINA: Smith 10583; THE NETHERLANDS: Bas 1960 (L).

OBSERVATIONS - The question of the occurrence of this species in North America has posed a problem to us, but we believe we have conclusively demonstrated that it does occur here in its typical form. It has been so frequently reported in the literature that one relying on the literature alone would consider it a common and wide-spread species with us. This is definitely not the case. Because previously in North America little or no attention was given to the anatomical structure of dermal layers, a whole group of somewhat similar species have been lumped under this name.

Our interpretation of this fungus is based on Neuhoﬀ's account (1956:193), his illustrations of the pileus cutis, and a detailed study of a collection (Smith 37499) which appears to agree in all respects with Neuhoﬀ's account. The distinguishing features of the species according to this concept are as follows: (1) the context changes to red or reddish where bruised or cut; (2) the taste is mild then bitter, but not acrid; (3) the color of the pileus and stipe varies from dark dingy yellow brown to almost olive-brown; (4) the cutis of the pileus is divided into a cellular layer 2-4 cells deep, and a sparse turf of versiform elements originating from and between the surface cells, and the turf elements measure (3.5-)4-10(-12) μ broad near the apex; (5) the caulocystidia are mostly clavate, subclavate or fusoid-ventricose, 5-9 μ broad; a few filaments 3.5-6 μ broad are also present; (6) the spore ornamentation is 1-1.5(-2) μ high and forms a complete to broken reticulum; (7) the gills vary from subdistant to distant.

A detailed account of the microscopic features of Smith-37499 follows:

Spores 8-10 x 7-9 μ , subglobose to broadly ellipsoid, wall non-amyloid, warts 0.8-2.0 μ high, bands strongly amyloid, in the form of ridges 1-2 μ high and 0.5-1 μ wide, branched or connected to form a partial reticulum, fine lines and isolated particles also present, webbing present and distinct to obscure, plage area with reduced ornamentation and weak amyloid reaction; sterigmatal appendage rather inconspicuous. Basidia 42-58 x 9-13 μ , 4-spored, broadest below the apex. Pleurocystidia none; pseudocystidia filamentous, crooked; cheilocystidia, 30-42 x 3-8 μ , ventricose, subcylindric, their apices obtuse, content hyaline. Pileus cutis an epithelial layer about 2-3 cells

L. fuliginosus var. *fuliginosus* - 4

deep, the cells 8-15 μ in diameter, of irregular shape from mutual pressure, those at the surface often smaller than those in the layer below; turf weak, of elements 18-30 x 4-8 μ , their content nearly hyaline to weakly yellow brown. Caulocystidia forming a distinct though often lax turf, the elements filamentose, cystidioid or clavate, 18-40 x 4-9 μ , arising from a layer of interwoven filamentose hyphae; content yellowish brown; rosettes present. Clamp connections none.

Because *L. fuliginosus* of nearly all European authors appears to us to be a collective species, we have taken our concept from the most complete modern work ^(Nen hoff 1956), a concept that agrees well with the Friesian description. Lange (1940:42) described and illustrated a number of variants (*L. fuliginosus* f. *speciosus*, *L. fuliginosus* f. *albipes*, and *L. fuliginosus* f. *virgineus*), but did not describe the essential characters, and since he did not keep type material (the actual specimen painted or described) we cannot now be certain about the features of the caulocystidia and pileus cutis. Wakefield and Dennis (1950) merely state that *L. lignyotus* and *L. picinus* are darker forms of *L. fuliginosus*. In our treatment of the American variants we have attempted to clarify this situation by describing the variants critically, naming them, and designating types. With such points of reference established further studies will be greatly facilitated. We feel almost certain that most of the variants found in Europe will differ somewhat from those we have described here from North America.

35964

LACTARIUS FULIGINOSUS

leg.-det. Moser, Switzerland, October 11, 1964

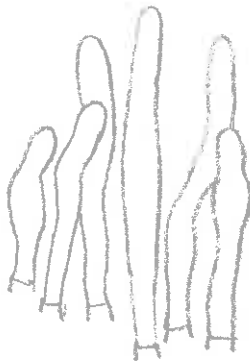
Spores 9.5-11(12) x 9-11 μ , globose or subglobose, warts 1.0-2.4(3.0) μ , webbing present, bands wide set and some branching. Basidia 47-54 x 10-12 μ , (2)4-spored. Pleurocystidia 48-63 x 5-7 μ , subcylindric to subventricose, rare 2-3 μ broad; cheilocystidia 22-50 x 3-5 μ , subcylindric. Gill trama of short-celled, interwoven hyphae. Pileus cuticle a zone of irregularly shaped cells, the surface bearing a turf of pale brownish pileocystidia, 24-52 x 3-7 μ , subcylindric, clavate, some crooked-irregular. Stipe cuticle of interwoven, perpendicular hyphae, surface bearing a lax turf of colorless caulocystidia, 28-52 x 4-5 μ , subcylindric; rosettes present. Clamp connections none.

Lactarius fuliginosus

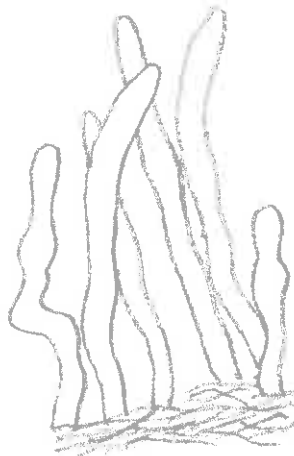
Moser (Term - 35964)



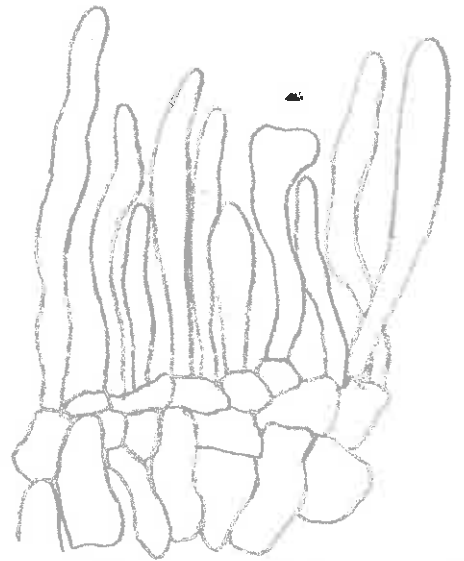
PP x 1000
(rare)



Ch x 1000



Stipe cuticle
x 1000



Pileus cuticle x 1000

Sm-37499

LACTARIUS FULIGINOSUS var. FULIGINOSUS

Tahquamenon Falls, Luce Co., Michigan, August 6, 1951

Spores ¹⁰8-~~10~~ x 7.5-10 μ , globose or subglobose, warts 0.8-2.0 μ high, stout or a few slender, bands widely spaced with a few narrow bands and lines, forming a partial reticulum. Basidia 50-60 x 10-12 μ , 4-spored. Pleurocystidia none; cheilocystidia 25-38 x 4-7 μ , filamentous to ventricose, often inconspicuous. Gill trama of short-celled, interwoven hyphae. Pileus cuticle an (epithelial) zone, 2-3 cells thick (30-50 μ), the zone brownish, bearing scattered pileocystidia, 18-32 x 4-6 μ , subcylindric, clavate, subfusoid, not forming a turf, subcuticular zone not gelatinous. Stipe cuticle of interwoven hyphae; resting on a subgelatinous zone, caulocystidia, 18-50 x 4-7 μ , cylindric, clavate, forming a dense turf (as in Sm-72312); rosettes present.

Sm-37499

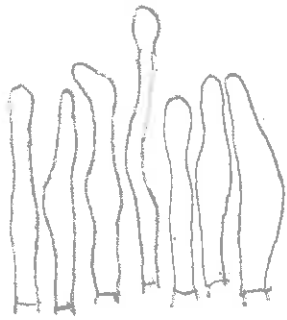
LACTARIUS FULIGINOSUS var. FULIGINOSUS

Tahquamenon Falls, Michigan, August 6, 1951

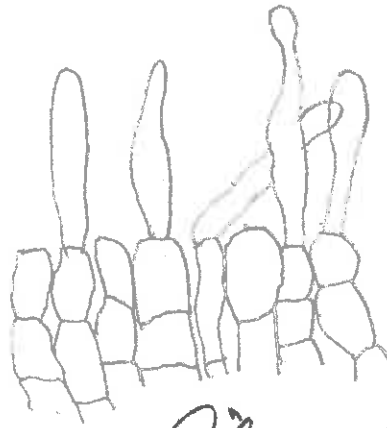
(Critically compared with Neuhoff's account by A. H. Smith)

Spores 8-10 x 7-9 μ , subglobose to broadly ellipsoid, warts 0.8-2.0 μ high, bands widely spaced, with some lines, webbing distinct to obscure. Basidia 50-58 x 10-12 μ , 4-spored. Pleurocystidia none; pseudocystidia filamentous; cheilocystidia 24-37 x 3-6 μ , cylindric, clavate, subfusoid, flask-shaped, often inconspicuous. Gill trama of short-celled, interwoven hyphae. Pileus trama vesiculose. Pileus cuticle a cellular (epithelial) zone, 2-3 cells deep, cells 8-30 x 6-15 μ , cuboid, barrel-shaped, subclavate, the terminal elements as pileocystidia, 20-34 x 3-10 μ , forming a turf. Stipe cuticle more or less a turf of caulocystidia, 18-43 x 3-5 μ , flask-shaped, nine-pin, clavate, subventricose, at times forming a turf; arising from interwoven hyphae; rosettes present. Clamps none.

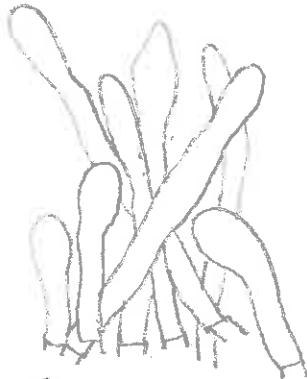
Sactarius fuliginosus var. *fuliginosus*
 Sm - 37499 (see another drawing)



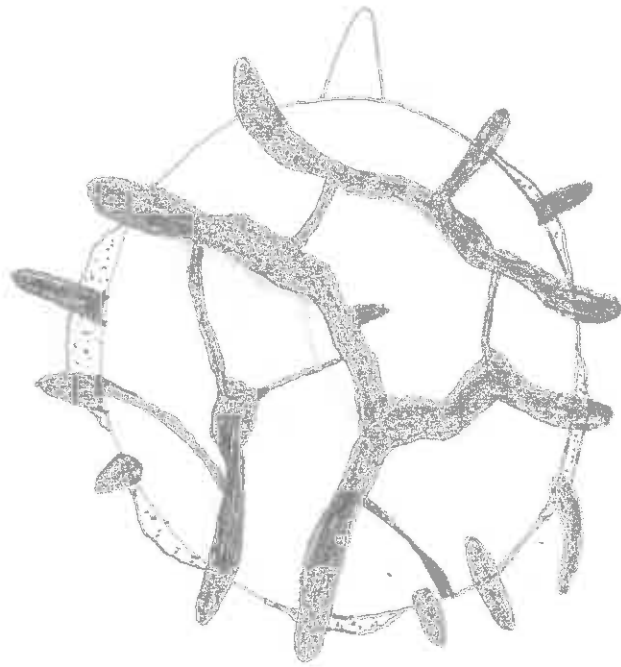
Ch - x 1000



Pileo - outside
 x 1000
 (pileo scattered, no turf)



Caulo turf

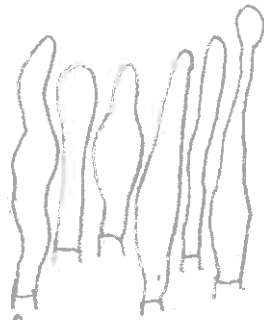
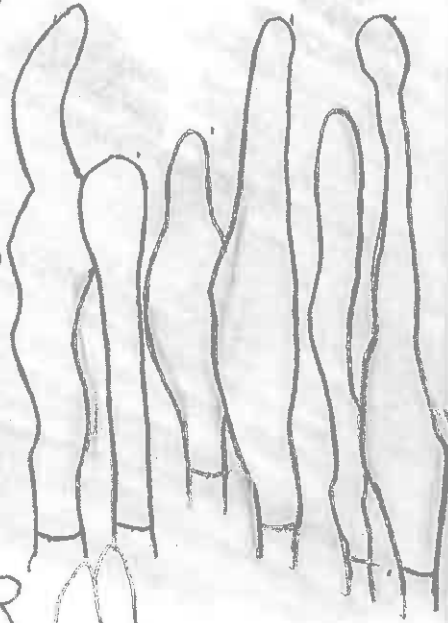


Spore - x 8000

Saccarimus fuliginosus var. *fuliginosus*
Sm - 37499

342

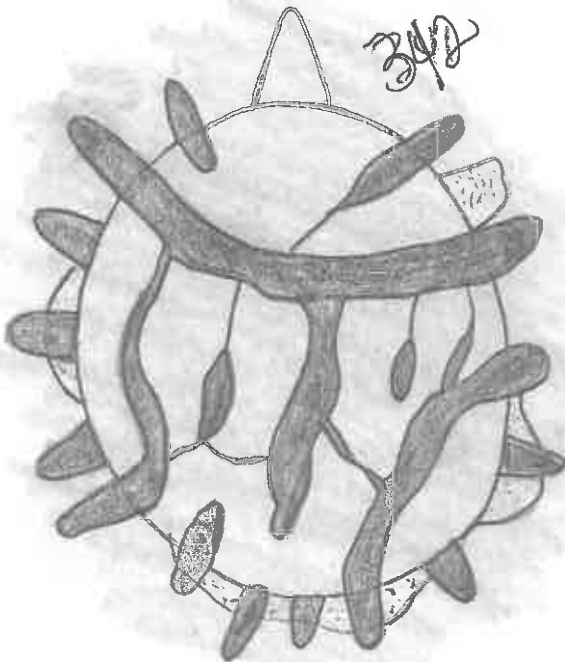
Ch - x 2500



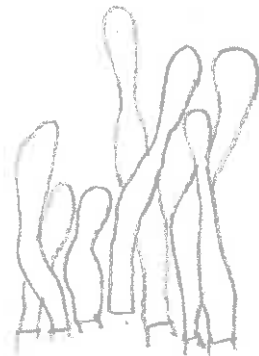
Ch - x 1000



Pileus ^{weak} turf - x 1000



x Spore - 8000



Caules turf - x 1000

Sm-75757

LACTARIUS FULIGINOSUS

Tahquamenon, Michigan, September 27, 1968 (near fuliginosus)

Notes by Smith

Pileus 2-4 cm, "dresden brown," velvety, unevenly colored, dry.
Latex white, unchanging, staining reddish cinnamon, quickly acrid.

Gills adnate to subdecurrent, creamy, staining reddish cinnamon,
close, narrow to moderately broad, not marginate.

Stipe about 3.5 cm x 7 mm, concolorous with the pileus, equal, hollow.

Notes by Hesler

Spores 7.5-9 x 7-8.5 μ , globose, subglobose, or broadly ellipsoid,
warts 0.7-1.3 μ , bands widely spaced, some lines and branches, forming a
partial reticulum, some with webbing. Pleurocystidia none; pseudocystidia
filamentous, 4-5 μ broad; cheilocystidia 26-48 x 4-6 μ , cylindric to
subcylindric. Pileus cuticle an epithelium, 2-4 cells deep, with scattered
pileocystidia, 25-40 x 4-10 μ , cylindric, clavate, or flask-shaped.
Stipe cuticle of interwoven hyphae, bearing a turf of colorless caulo-
cystidia, cylindric, clavate, or ventricose, 18-46 x 3-8 μ .

Except for taste, this is L. fuliginosus which is scarcely acrid,
^{mild then}
usually bitterish.

Sm-75982 LACTARIUS FULIGINOSUS var. FULIGINOSUS
Tahquamenon, Michigan, August 13, 1968.

Notes by Smith

nearly close to
Taste mild. Gills [^]subdistant, ochraceous-tan. Spores ochraceous.

Notes by Hesler

Spores 7-9.5 x 7-8.5 μ , subglobose to ellipsoid, warts 0.5-0.8 μ high, bands forming a partial or complete reticulum. Otherwise as described in Brittonia 14:416.

Sm-77855 LACTARIUS FULIGINOSUS var. FULIGINOSUS

Tahquamenon, Luce Co., Michigan, August 11, 1969

Notes by Smith

Taste more or less mild. Stains reddish. Spores yellow.

Notes by Hesler

Spores 7.5-10 x 7-9 μ , warts 0.8-1.7 μ , bands wide-spaced, forming a partial reticulum. Basidia 42-50 x 9-10 μ , 4-spored. Pleurocystidia none; cheilocystidia 30-45 x 3-6 μ , cylindric or subfusoid. Pileus cuticle a zone, 2-3 cells deep, bearing a colorless turf of pileocystidia. Stipe cuticle of interwoven hyphae bearing a turf similar to the pileus.

Sm-78608a

LACTARIUS FULIGINOSUS var. FULIGINOSUS (?)

Ives Lake Area, Marquette Co., Michigan, August 27, 1970

Notes by Smith

Cap pale bister. Latex stains reddish (at stipe base); taste weakly acrid. Lamellae distant, broad, decurrent, edges concolor. Stipe pale bister.

Notes by Hesler

Spores 8-11 x 8.5-11 μ , globose to broadly ellipsoid, warts 0.8-2.0 μ high, bands wide-spaced, reticulum partial. Basidia 48-62 x 10-12 μ , 4-spored. Pleurocystidia none; cheilocystidia 28-38 x 4-7 μ , subcylindric to subventricose. Pileus cuticle of brown cells, 3-4 deep, bearing turf elements 16-40 x 4-9 μ , cylindric, flask-shaped. Stipe cuticle of interwoven hyphae, bearing more or less a turf, the elements 34-83 x 5-11 μ , cylindric, clavate, subventricose, rosettes present.

This keys to var. fuliginosus, but pileus color is wrong.

~~Sm-78667~~

~~Sm-78667~~ LACTARIUS FULIGINOSUS var. FULIGINOSUS

Canyon Lake Swamp, Marquette County, Michigan, August 29, 1970

Notes by Smith

Cap to 12 cm, olive-drab to grayish buff, unpolished. Latex white, staining gills cinnabar. Taste mild.

Lamellae narrow, crowded, ochraceous, staining brown in age.

Stipe smoky gray, naked.

Spores ochraceous.

Notes by Hesler

Spores $7.5-9.5 \times 6.5-8.5 \mu$, warts $0.3-0.8 \mu$, bands and branches forming a partial reticulum. Pleurocystidia none; cheilocystidia $34-48 \times 5-8 \mu$, subcylindric to subfusoid, extending up the sides about 200μ . Pileus cuticle a zone, 2-3 cells deep bearing pileocystidia which rarely form a turf of colorless pileocystidia. Stipe cuticle of interwoven hyphae, bearing a thin turf of colorless caulocystidia; rosettes present.

Lectarius fuliginosus var. *fuliginosus*
Sm - 78667



Ch x 1000

Sm-78669a

LACTARIUS ~~FULIGINOSUS~~ var. ~~FULIGINOSUS~~ ?

Canyon Lake Swamp, Marquette County, Michigan, August 29, 1970

Notes by Smith

Pileus between drab and olive-brown, in age flushed ochraceous, margin lobed. Taste mild.

Lamellae adnate, white, then ochraceous, staining cinnabar, narrow, crowded.

Stipe 8-15 mm thick, pallid to concolor with pileus.

Notes by Hesler

Spores 7-9 x 7-8 μ , globose, subglobose, or broadly ellipsoid, warts 0.3-0.8 μ , bands and branches forming a partial reticulum.

Basidia 50-57 x 10-12 μ , 4-spored. ~~Other micro characters as in~~

~~Brittonia 14:419.~~

Sm - 80528

LACTARIUS FULIGINOSUS

Scattered under beech, Blackland, England, September 20,
1971

Notes by Smith

Pileus 5-9 cm broad, convex-depressed, with a straight margin, in age shallowly-depressed with a spreading margin, margin often crenate-sulcate, dry, unpolished, grayish snuff-brown to grayish cinnamon buff, often wrinkled around disc, staining red. Context fragile, thick, white; odor none, taste astringent-acrid. Latex copious, white, staining injured areas orange-brown to reddish, taste slowly slightly acrid.

Lamellae adnate to decurrent, staining reddish where injured, subdistant, pruinose in age (edges show no dark color - L.R.H.).

Stipe 4-7 cm long, 11-15 mm thick, stuffed, pallid, naked, dry, basal mycelium white, context reddish where cut.

Spores in deposit ochraceous.

Notes by Hesler

Spores 8-10 x 7.5-9(10) μ , subglobose to broadly ellipsoid, warts 1-2.3 μ high, coarse, with bands and branches rather widely-spaced, webbing present, bands not encircling the spore. Basidia 42-53 x 9-14 μ , (2)4-spored, abruptly broadened above. Pleurocystidia none; pseudocystidia scattered, 2-4 μ broad, often gnarled, crooked; cheilocystidia

20-25 x 3-4 μ , subclavate, subcylindric, inconspicuous. Pileus cuticle of brown cell chains, of irregular shape, terminal elements forming a turf, often clavate or at times more or less subfusoid, arising from a distinct colorless zone of interwoven hyphae. Stipe cuticle of colorless hyphae which bear scattered (scarcely a turf), clavate to subcylindric caulocystidia: 16-27 x 4-7 μ ; rosettes present.

Spores wrong for L. pterosporus. Near L. fuliginosus var. fuliginosus; it seems close to Moser (Tenn 35964), L. fuliginosus from Switzerland, but with slightly different pileocystidia, shorter caulocystidia, and no pleurocystidia.

Factarius fuliginosus

Sm-80528

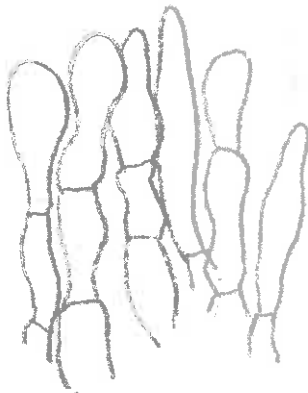
Pl. 0



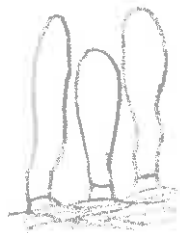
Ch x
1000



Pseudo
x 1000



Piles x 1000



Pauls x 1000

Sm-80535

LACTARIUS FULIGINOSUS

South of Tyne River, near Blanchland, England, September 20,
1971 (labelled: "near fuliginosus")

Notes by Smith

Latex white, not abundant; taste slightly astringent.

Gills narrow, crowded, ochraceous, staining red.

Stipe naked.

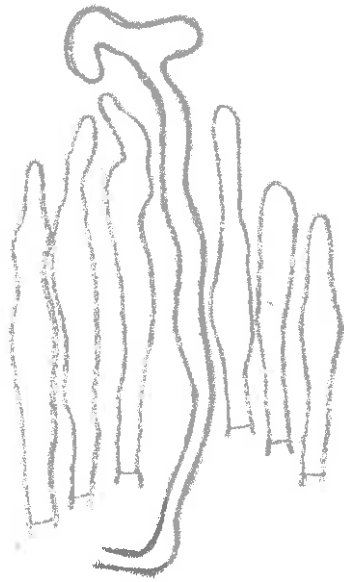
Notes by Hesler

Spores 8.5-10(11) x (7) 7.5-9 μ , warts 1.0-2.3 μ , webbing present, bands vary from one or two (and no reticulum) to bands forming almost a complete reticulum. Pleurocystidia none, except cheilocystidia extend up sides a short distance back of the gill-edge; cheilocystidia 35-52 x 5-7 μ , more or less filamentous to subventricose; pseudocystidia filamentous, present on sides and edges of gills, and among the pileocystidia. Pileocystidia pale brownish, similar to cheilocystidia, arising from a chain of 2-3 cells, or as a hyphal branch, forming a turf. Stipe cuticle of interwoven hyphae, bearing caulocystidia, similar to cheilocystidia but colorless, scattered or a thin turf; rosettes numerous.

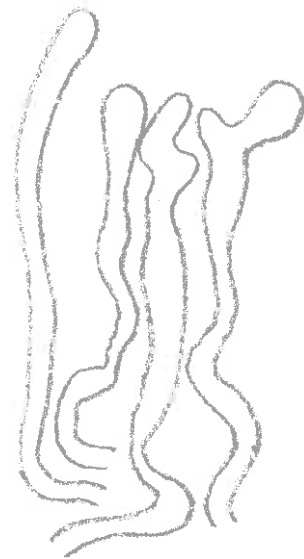
Agrees with L. fuliginosus better than with either azointes or pterosporus.

Factarius fuliginosus

Sm - 80535 (from England)



Ch (with one pseudo)
x 1000



Pseudo x 1000

LACTARIUS FUMEACOLOR

Under hemlock, Burl.-92, 1907, North Carolina

Type (of L. mucidus)

Spores white in deposit, 7.5-9.5(10) x 6.5-8 μ , ellipsoid, more rarely subglobose, warts 0.2-0.5 μ high, broad and narrow bands forming a partial or complete reticulum. Basidia 36-50 x 7-8 μ , (2)4-spored. Pleurocystidia 50-90 x 5-8(12) μ , ventricose, more or less acuminate, granular; cheilocystidia 25-44 x 4-7 μ , ventricose, flask-shaped to subcylindric, apices tapering, granular. Gill trama subparallel, sphaerocysts none. Pileus vesiculose. Cuticle of pileus an ixotrichodermium, 160-240 μ thick, resting on a brownish hypodermium. Stipe cuticle an ixocutis; hypodermium brownish; rosettes none. Clamp connections none.

Shaffer - 6266

LACTARIUS (FUMEACOLOR?)

Solitary, on humus, in hemlock-hardwood forest, Indian Creek, Swain Co.,

N.C., July 21, 1970

Notes by Shaffer

Lamellae stained dark brownish olive to dark grayish olive where injured.

Notes by Hesler

Spores 8.5-10.5 x 6.5-8 μ , warts 0.4-1.0 μ , bands and branches more or less broken, forming a partial reticulum. Basidia 50-63 x 9-12 μ , 4-spored. Pleurocystidia 74-102 x 7-12 μ , ventricose-acuminate; cheilocystidia 42-77 x 6-8 μ , indistinct. Stipe cuticle a thin ixocutis; rosettes present. Clamps none.

Identification handicapped by lack of notes on latex color and taste; spore-color in deposit; pileus colors, etc.

Near fumeacolor.

Bigelow 12329

LACTARIUS ^{fumeacolor} ~~MUCIDUS var. CINEREOLACTES~~ ²⁰³ var. nov.

WMNF, N.H., August 16, 1963.

Notes by Bigelow

7 cm broad, expanding, depressed, azonate. Context
Pileus "avellaneous," glutinous, ^{staining brown,} context acrid.

Latex white, drying gray, staining gills brown, acrid.

Gills sordid cream, ^{staining brown,} decurrent, close, moderately broad.

5 cm long, 16 mm thick, viscid, solid
Stipe light buff.

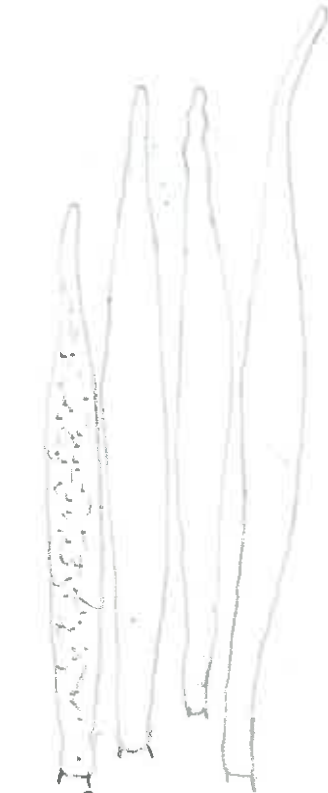
Spores sordid "warm buff."

Notes by Hesler

Spores (8) 9-11.5 x 7.5-9 μ , ellipsoid, warts 0.5-1.2 μ high, some isolated, bands broken, branched, with some connecting lines, no reticulum. Basidia 47-53 x 10-12 μ ~~Mar~~ 4-spored. Pleurocystidia 68-102 x 7-10 μ , more or less ventricose, apices tapering, granular-spangled; cheilocystidia 30-38 x 5-7 μ , more or less fusoid. Gill trama undulating subparallel to slightly interwoven. Pileus trama vesiculose. Pileus cuticle a gelatinous zone, hyphae arranged lattice-like; hypodermium brown. Stipe cuticle a thin ixocutis, 25-35 μ thick; rosettes present. Clamp connections none.

Its distinctive characters: latex white then gray, gills staining brown, more slender pleurocystidia, smaller cheilocystidia, avellaneous pileus.

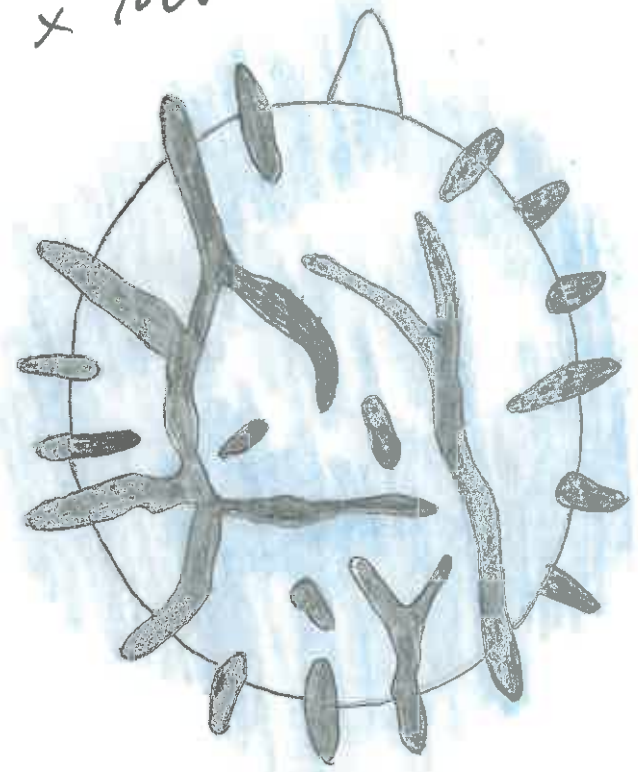
Ractarium ^{fumescens} ~~muscula~~ var. *cinerascens* ^{pinus} var. ~~nov.~~
Bigelow - 12329



Sp - x 1000



Sp - x 1000



605

Spore - x 8000

35688

fumeacolor
LACTARIUS ~~MUCIDUS~~ var. ~~CINEROLACTES~~ var. nov. ^{EUS}

On soil, in deciduous woods, Horse Cove, Highlands, North Carolina,
August 17, 1970

Pileus 6-9 cm, plum-colored all over when young, becoming paler-plum, to pale ochraceous in areas, viscid-glutinous. Flesh white, firm; odor slight (mild, fungoid). Latex white, becoming dingy grayish-white as it dries, staining the gills brownish, *acid*.

Lamellae adnate-subdecurrent, white becoming densely brown-flecked or spotted, brownish where bruised, some forked behind, lamellulae rather numerous, close medium narrow.

Stipe white, becoming brownish-flecked, equal, hollow, viscid.

Spores in deposit: "cream buff;" spores 8.5-11 x 7-9 μ , warts 0.4-0.8(1.0) μ , some only partially amyloid, bands and branches forming a partial reticulum. Pleurocystidia 82-117 x 9-15 μ , ventricose-acuminate; cheilocystidia similar, smaller. Pileus and stipe cuticle an *hypodermium slightly differentiated (as radial hyphae)*; *stipe* ixocutis; Clamps none.

cuticle on ixocutis, a thin ixocutis.

Bas - 460

fumosus var.
LACTARIUS FUMOSOIDES (Sm. + Hes.) comb. nov.

Near Pellston, Michigan, near bog, July 28 (1965?)

Spores 7-8.5(9) x 6-7.5(8) μ . Other micro characters as
in the Type (Sm-63040).

Ammirati - 1420

fumosus var.
LACTARIUS FUMOSOIDES (Sm. + Hes.) comb. nov.

Huron Mt. Club, Fisher Creek, Michigan, August 12, 1968

Notes by Ammirati

Pileus 3.5 cm broad, "Dresden brown" to "buffy brown," dry velvety. Odor and taste mild. Latex white, becoming reddish (in contact). Lamellae adnate-subdecurrent, close or nearly so, rather narrow, darker than "light ochraceous buff," edges not marginate. Stipe dry, lighter than pileus.

Spore deposit near "light ochraceous buff."

Notes by Hesler

Spores 7-9.5 x 6.5-8 μ , ellipsoid to subglobose or globose, warts 0.3-0.6(1.0) μ , bands and lines forming a partial reticulum. Basidia 48-55 x 10-12 μ , 4-spored. Pleurocystidia none; pseudocystidia 5-7 μ broad, filamentous, scattered; cheilocystidia 30-38 x 3-4 μ , more or less cylindric. Pileus cuticle a trichodermium, the turf poorly developed or none, pileocystidia 26-40 x 6-12 μ , basal cells enlarged and 2-3 in a row. Stipe cuticle a turf, caulocystidia 35-75 x 4-8(12) μ , arising from interwoven hyphae.

The pileus color and staining suggest that it is near L. fumosoides, but cheilocystidia a bit narrow.

Sm - 63040

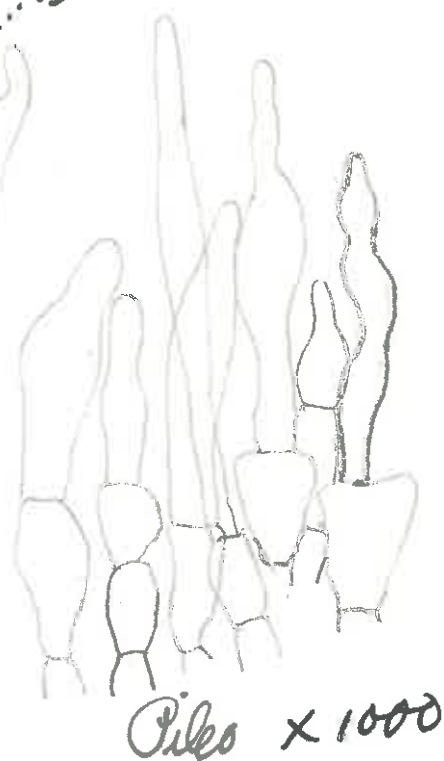
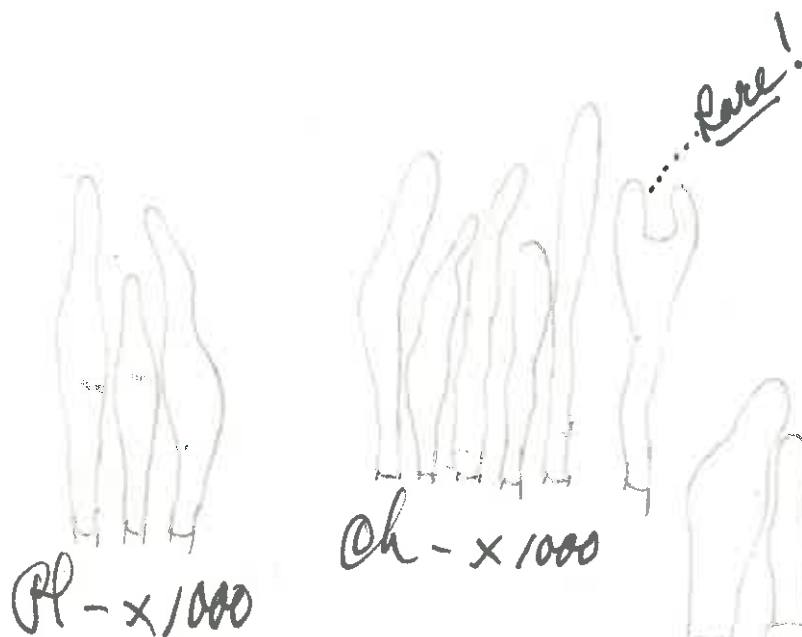
fumosus var.
LACTARIUS FUMOSOIDES (Sm & Hes) — ~~Exe~~

Type, Reese's Bog, Cheboygan Co., Michigan, August 27, 1960.

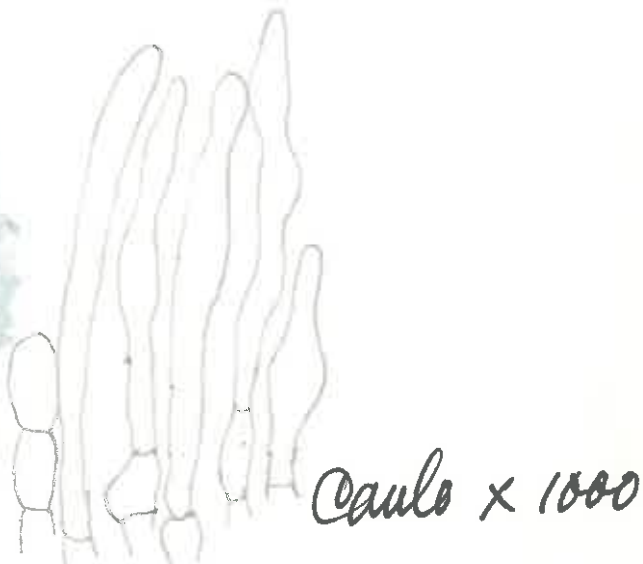
Notes on Type (*of fumosoides*)

Spores 7-9 x 6-8 μ , warts 0.4-1.0 μ broad, bands few, widely spaced, with more narrow bands, forming a partial reticulum, rarely complete. Rosettes none. (Otherwise, as in the description of type).

Lactarius fumosoides
 Type (Sm-63040)



Spore - x 8000



Sm-78648

LACTARIUS ~~FUMOSIDES~~

fumous var. *fumosoides* (Sm. & Hes.)
Comb. nov.

Canyon Lake Swamp, Marquette Co., Michigan, August 28, 1970

Notes by Smith

Cap more or less pale olive buff, glabrous. Taste mild. Lamellae crowded, narrow, ochraceous tan, staining reddish slightly.

Spores ochraceous.

Notes by Hesler

Spores $7.5-8.5(9) \times 7-8.5 \mu$, subglobose to broadly ellipsoid, warts $0.3-0.5 \mu$, bands forming a partial or nearly complete reticulum. Basidia $40-48 \times 9-11 \mu$, 4-spored. Pleurocystidia none; cheilocystidia cylindric, $24-40 \times 3-5 \mu$. Pileus and stipe cuticle as in Sm-78653.

Sm-78653

LACTARIUS ~~FUMOSCHES~~

fumosus v. *fumosoides* (Sm. + Hes.)
Comb. nov.

Canyon Lake Swamp, Marquette Co., Michigan, August 28, 1970

Notes by Smith

Pileus unpolished, pale olive brown, margin pale gray. Taste mild.

Lamellae crowded, narrow, ochraceous, stain reddish, edges concolor.

Stipe more or less naked and pallid, brownish when cut.

Spores ochraceous.

Notes by Hesler

Spores 7-8.5 x 6-7 μ , warts 0.3-0.5 μ , bands forming a partial reticulum. Pleurocystidia none; cheilocystidia 28-44 x 4-6 μ , cylindric, rarely ventricose. Pileus cuticle a limited zone of brown cells bearing colorless, scattered pileocystidia, 38-50 x 3-5 μ . Stipe cuticle of interwoven hyphae bearing a sparse turf of colorless caulocystidia, similar to pileocystidia; rosettes present.

39006

~~xxxx~~

LACTARIUS FUMOSUS Pk. var. FUMOSUS

Cades Cove, August 15, 1973

Pileus 3.5 - 6.5 cm broad, "Brussels Brown" to "light brownish olive", minutely plush-like, margin even. Context white. Latex white, drying and staining the gills and flesh pinkish; taste peppery.

Lamellae subdistant, medium broad, edges not marginate, lamellulae numerous, "chamois".

Stipe 4-6 cm long, 8-12 mm thick,

fuliginosus v. *fuliginosus*
~~*subgelatinosus*~~

Sm-67321 LACTARIUS ~~FULIGINOSUS~~ var. Sm-67321 var. nov.

In mixed woods, North Pond, Mass., August 26, 1963.

Notes by Smith

Pileus golden buff brown. Gills subdistant. Stipe concolorous with pileus, velvety. Slowly slightly acrid. Stains reddish.

Notes by Hesler

75-10(10.6)
Spores ~~75-10(10.6)~~ 6.5-8 μ , globose to short-ellipsoid, warts coarse, 0.4-0.8 μ high, bands and lines forming more or less a reticulum. Pleurocystidia ~~as~~ (1) ^{aa}pseudocystidia, (2) ^{aa}cheilocystidia extending up the sides 200-350 μ ; cheilocystidia 30-42 x 3-6 μ , hair-like, cylindrical to subventricose, numerous. Gill trama of narrow, subparallel hyphae. Pileus trama vesiculose. Pileus cuticle a zone of small cells bearing a turf of pileocystidia, 18-35 x 3-5 μ , cylindric to subventricose, colorless to pale brown. Stipe cuticle of interwoven hyphae bearing a turf of caulocystidia, 30-48 x 3-4(5) μ , similar to pileocystidia, colorless or nearly so, the subcuticular zone more or less gelatinous. Stipe context: (1) rosettes in outer cortex, (2) vesiculose nests in the inner cortex. Clamp connections none.

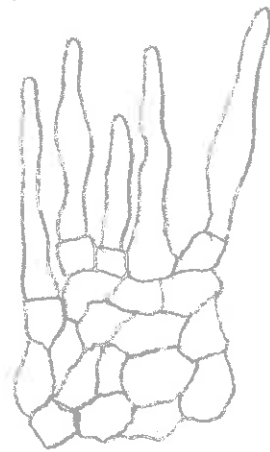
This seems near L. fuliginosus var. fuliginosus which has much broader caulocystidia and warts on spores 1-2 μ high, ornamentation of bands ~~forming a distinct reticulum~~ is larger, forming a distinct reticulum, disc rugose, with bitter latex, the subcuticular pileus zone not gelatinous.

A new variety? Cf. ~~Tenn-25748~~.

Lactarius fuliginosus var. ~~*subgelatinosus* var. nov.~~
Sm-67321 *fuliginosus* var. *fuliginosus*



Ch x 1000



Pileus article + truf
- x 1000

Sm-72384

Lactarius ~~FULIGINOSUS~~ var. *SUBGELATINOSUS* var. nov.

Tahquamenon, Michigan, August 23, 1965

Notes by Smith

TYPE

Pileus 3-6 cm broad, convex, then slightly depressed, "sudan brown" to "Brussels brown," velvety. Latex staining gills vinaceous, taste slightly peppery.

Lamellae adnate with a subdecurrent tooth, soon tawny ochraceous, broad, subdistant, edges concolor.

Stipe 4-5 cm long, 8-12 mm thick, concolorous with pileus, finally plicate above, equal, velvety, solid.

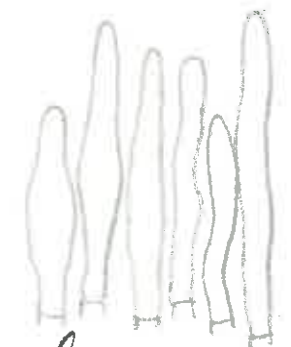
Notes by Hesler

Spores ochraceous in deposit 8-11 x 7.5-9 μ , globose or subglobose, warts 0.7-1.2 μ high, with broad bands sometimes widely spaced with some lines and narrow bands, forming a partial or complete reticulum, slight webbing present. Basidia 47-54 x 9-11 μ , 4-spored. Pleurocystidia none; pseudocystidia filamentous, 3-5 μ broad; cheilocystidia 28-42 x 3-6 μ , cylindric, ventricose, extending up sides about 125 μ . Gill trama of short-celled slightly interwoven hyphae. Pileus cuticle an epithelium, the cells 5-15 x 4-9 μ , more or less in chains, the terminal elements as pileocystidia 12-35 x 4-8 μ , clavate or cylindric to ventricose, yellowish in KOH, forming a short turf, all resting on a subgelatinous zone.

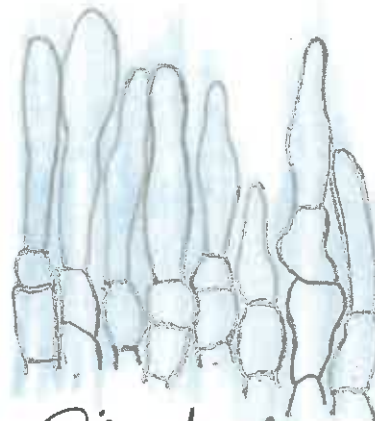
Stipe cuticle of interwoven hyphae, bearing a turf of yellowish-brown caulocystidia, 28-45 x 2-4(7) μ , filamentous or rarely clavate-capitate, all resting on a subgelatinous zone; rosettes present. Clamp connections none.

Lactarius fuliginosus var. *fuliginosus* PK. var. *fuliginosus*
~~*Lactarius fuliginosus* var. *subglaucescens* var. nov. C~~
 Sm - 72384

Phytogali

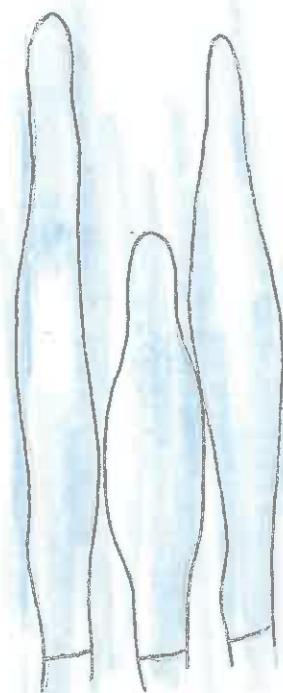


Ch - x 1000



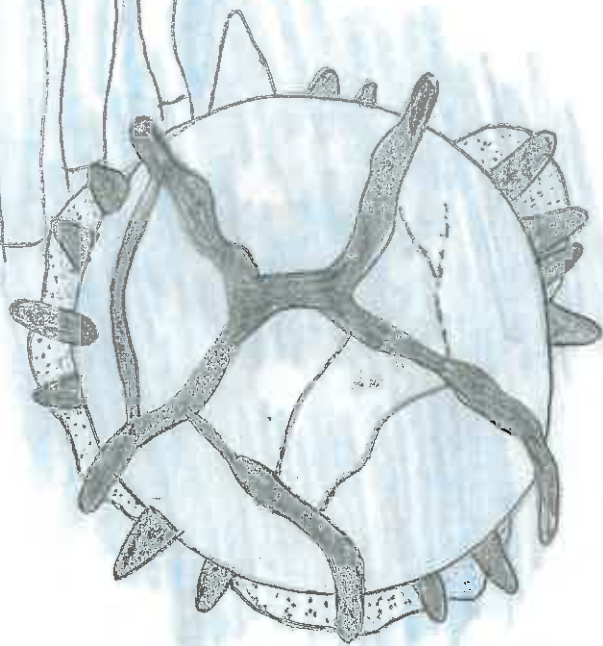
1665

Pileo turf x 1000



1546

Ch - x 2000



1545

Spore x 8000



1666

Caulo turf x 1000

Sm-75008

LACTARIUS ~~FULIGINOSUS var. SUBGELATINOSUS var. nov.~~

fumosus PK. var. *fumosus*

Tahquamenon, Michigan, August 14, 1967 (fuliginosus group)

Notes by Smith

Cap yellow-brown, velvety. Flesh stains reddish. Latex copious, more or less acrid.

Lamellae close to subdistant, not marginate.

Stipe yellow-brown, velvety.

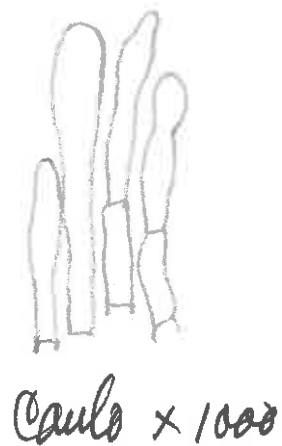
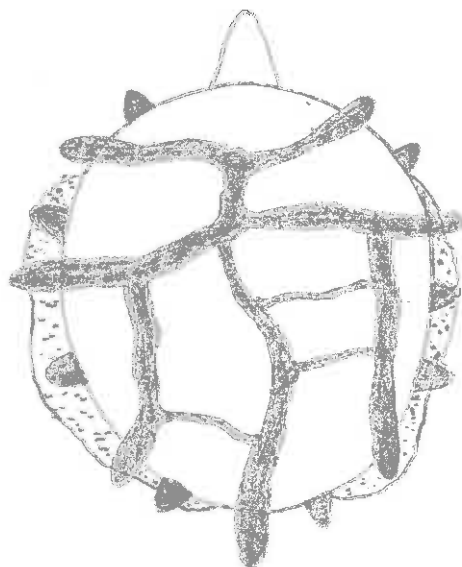
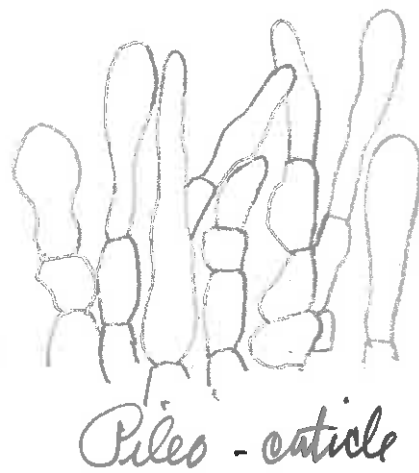
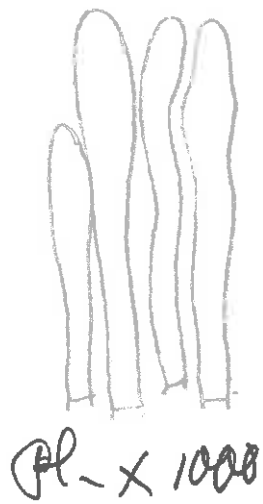
Spores yellowish.

Notes by Hesler

Spores 6-8 x 5.5-7 μ , ellipsoid to subglobose, with some webbing, warts 0.2-0.6 μ (1.0), bands widely spaced, with a few lines, forming a partial or at times nearly complete reticulum. Basidia 47-53 x 9-11 μ , 4-spored. Pleurocystidia 38-54 x 5-8 μ , cylindric; pseudocystidia filamentous; cheilocystidia 22-37 x 3-7 μ , cylindric to ventricose. Gill trama of narrow, subparallel hyphae. Pileus cuticle of inflated cells, bearing scattered or a thin turf of pileocystidia, 16-30 x 5-8 μ , cylindric to clavate; at times the subcuticular zone is subgelatinous. Stipe cuticle of interwoven hyphae bearing a turf of caulocystidia, 27-42 x 3-7 μ , clavate or ventricose; the subcuticular zone subgelatinous; rosettes present. Clamps none.

~~cf. closely with Sm-72384 (*L. fuliginosus* var. subgelatinous var. nov.)~~

Lactarius fuliginosus var. ~~subgelatinosus~~
 Sm - 15008 *fumosus* v. *fumosus*



Bas - 4542

LACTARIUS FULVISSIMUS Romagn.

In mixed deciduous forest, Germany, September 24, 1965

Notes by Bas (Trans. by Donk)

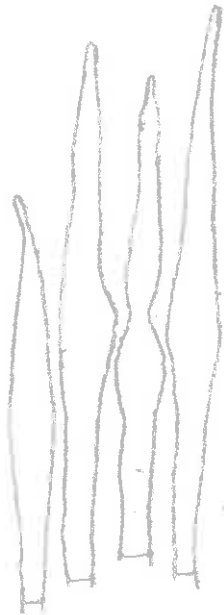
Cap wine-red in center, margin more brick-pink with darker small warts. Flesh practically mild with a faint smell of bugs. Latex white. No strongly encrusted hyphae under the cuticle. Odor practically mild, but of dried material like fresh tobacco or Rosa rubiginosa (sweet briar) or certain apples (correction by Bas).

Notes by Hesler

Spores (6.5)7-8.5 x 6-7.5 μ , ellipsoid, warts 0.2-0.5 μ , a few isolated, bands broken and with some connecting lines. Basidia 43-52 x 9-11 μ , 4-spored. Pleurocystidia 54-73 x 5-7 μ , slender-ventricose, acuminate, granular, somewhat scattered; cheilocystidia 38-52 x 4-7 μ , similar. Gill trama of narrow, undulating, subparallel hyphae. Pileus cuticle an indistinct zone, not greatly differentiated, of colorless, interwoven hyphae with many or most cells inflated (somewhat similar to that in L. camphoratus), the elements appearing subgelatinous hyphae, the terminal elements often more or less, rosettes present. Clamps none.

Ractarium fulvissimus Romagn.

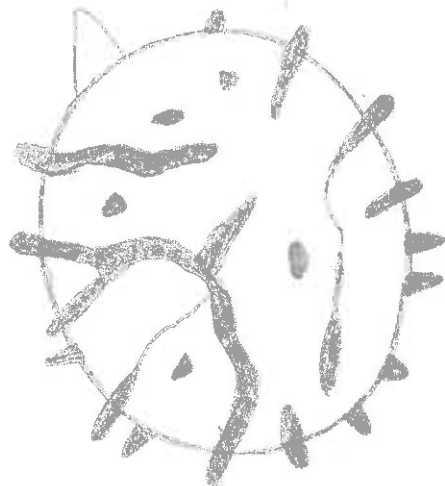
Bas - 4542



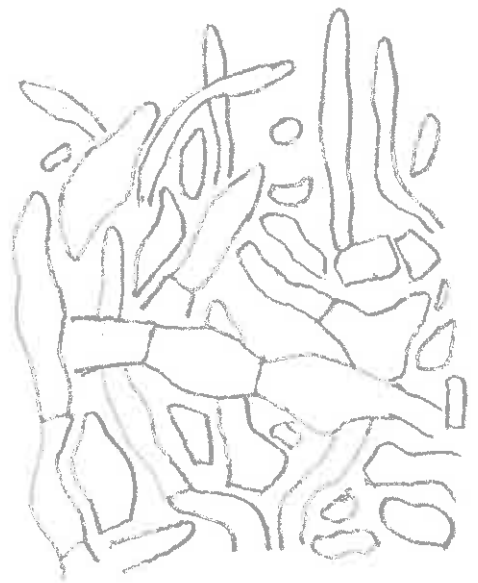
Sp - x 1000



Ch - x 1000



Spore - x 8000



Pidem - cuticle x 1000

LACTARIUS FUMEACOLOR Burlingham

Mycologia 37:57. 1945

ILLUSTRATIONS:

Burlingham, Mycologia 37, fig. 4, 6 D.

Pileus up to 12 cm broad, convex, centrally depressed, finally infundibuliform, fumous to otter brown with some faint buff tone 1 to putty color in the center, azonate to faintly zoned, glabrous except the white-pruinose margin, very viscid, cuticle separable on the margin. Context white, staining snuff brown to raw umber from the latex; odor not distinctive. Latex white, slowly staining wounds, especially the lamellae, at first snuff brown then raw umber tone 4, slowly very peppery.

Lamellae somewhat decurrent, narrowed at the stipe, fleshy-white to putty color, staining raw umber where injured, unequal, mostly simple, close, rather narrow.

Stipe 1.5-2.5 cm long, 5-8 mm thick, fleshy-white ~~tone 4 to putty~~ tone 4 to putty color, slightly viscid, equal.

Spores in deposit maize yellow tone 2, 8.5-11.5 x 7.5-9 μ , ellipsoid, warts 0.6-1.2 μ high, with broad, more or less broken bands, rarely with fine lines. Basidia 48-58 x 8-12 μ , 4-spored. Pleurocystidia 62-75(102) x 7-12(15) μ , ventricose, apices tapering, granular; cheilocystidia 40-76 x 6-10 μ , ventricose, similar. Pileus trama vesiculose. Cuticle of pileus a gelatinous zone, an ixocutis, 100-200 μ thick, of slender colorless hyphae; hypodermium 60-80 μ thick, brown.

Cuticle of stipe a narrow (20-40 μ) thick zone of gelatinous hyphae, an ixocutis. Pileocystidia and caulocystidia none. Clamp connections none.

HABIT, HABITAT, AND DISTRIBUTION - On soil, under live-oak or mockernut, Florida.

MATERIAL STUDIED - FLORIDA: Burlingham 2, type (NY), Kelly park, Rock Springs, Orange Co., April 3, 1944.

OBSERVATIONS - From L. trivialis and L. limacinus it differs in the latex staining the wounds raw umber and in the occasional zonate appearance. From the latter it alsodiffers in the absence of agglutinated tomentum on the pileus margin and in the maize colored spores. It differs from L. pallens in pileus colors, and in the ornamentation of the spores.

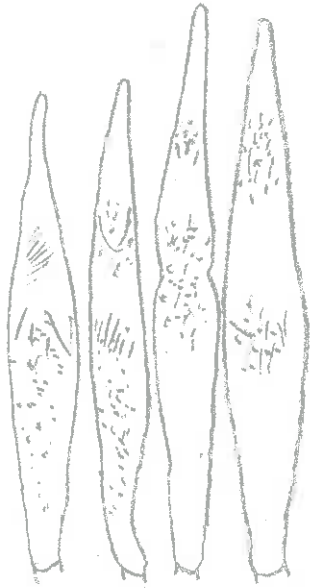
LACTARIUS FUMEACOLOR Burl.

Under live-oak or mockernut, Kelly Park, Rock Springs, Orange Co.,
Florida

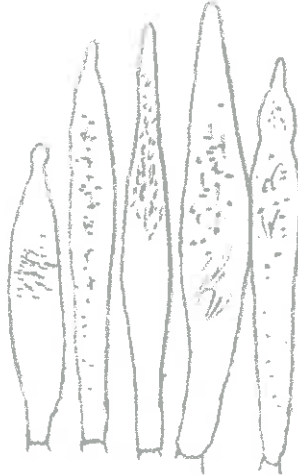
Type

Spores 8.5-11.5 x 7.5-9 μ , maize yellow tone 2 in deposits, ellipsoid, warts 0.6-1.2 μ high, with broad, more or less broken bands rarely with fine lines. Basidia 48-58 x 8-12 μ , 4-spored. Pleurocystidia 62-75(102) x 7-12(15) μ , ventricose, apices tapering, granular; cheilocystidia 40-62 x 6-10 μ , ventricose, similar. Gill trama cellular, with subparallel hyphae. Pileus trama vesiculose. Cuticle of pileus a gelatinous zone, an ixocutis, 100-180 μ thick, of slender colorless hyphae; hypoderm narrow. Cuticle of stipe a narrow (20-40 μ thick) ixocutis; hypoderm narrow. Pileocystidia and caulocystidia none. Clamp connections none.

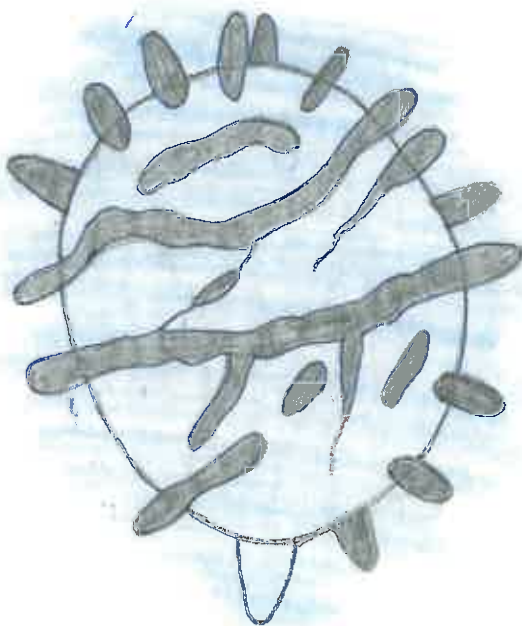
Sactarius fumeacolor Burl.
Type



Pl- x 1000



Ch- x 1000



663

Spore - x 8000

Sm-63892

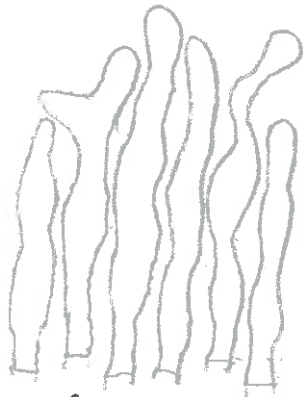
fumosus v. *fumosus*
LACTARIUS ~~FUMOSIBRUNNEUS~~

In hardwood forest, Cheboygan Co., Michigan, August 11, 1961

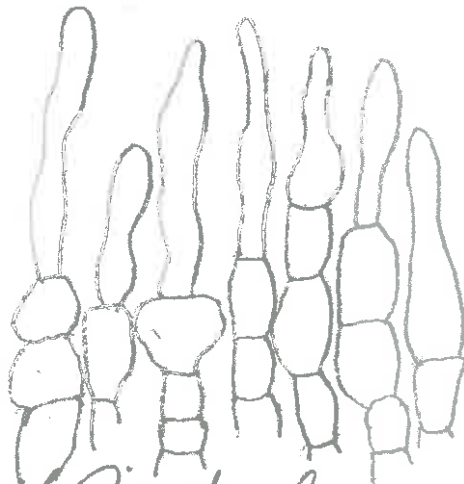
~~WATSON~~

Spores 7-9(9.5) x 6-8.5 μ , subglobose or globose to broadly ellipsoid, warts 0.8-1.6 μ high, bands widely spaced, of somewhat uneven width and a few lines, forming a partial reticulum, with some webbing. Basidia 38-52 x 8-11 μ , 4-spored. Pleurocystidia none; pseudocystidia few; cheilocystidia 32-50 x 4-6 μ , cylindric, ventricose, often slightly constricted, extending up sides 150 μ . Gill trama of narrow, subparallel hyphae. Pileus cuticle a chain of 2-3 cells, the terminal elements as pileocystidia, 18-38 x 4-8 μ , cylindric, ventricose, flask-shaped, forming a turf. Stipe cuticle a turf of caulocystidia, 24-32 x 3-7 μ , cylindric, clavate, ventricose, arising from interwoven hyphae; rosettes present. Clamps none.

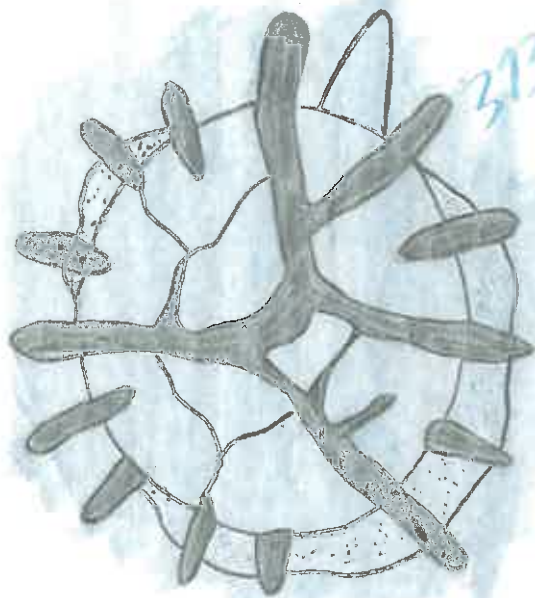
Factarium fumosus Ph. var. *fumosus*
~~*fumoviridescens*~~
 Sm-63892 - ~~type~~



Ch - x 1000



Pileoturf - x 1000



Spore - x 8000



Cauloturf - x 1000

fumosus v. *fumosus*

Bigelow - 14830 LACTARIUS ~~FUMOSIBRUNNEUS~~ Sm. & Hes.

Under hardwoods, Hawley State Forest, Massachusetts, August 26, 1966

Notes by Bigelow

Cap and stipe dull smoky brown, dry, rugose around the shallowly depressed disc. Gills adnate to short decurrent, dull "warm buff," close to subdistant, narrow to medium broad. Latex white, staining the gills and context red.

Spores ochraceous, near "chamois" to "honey yellow."

Notes by Hesler

Spores 8-11 x 8-10 μ , globose or subglobose, or broadly ellipsoid, warts 1.0-2.0(2.5) μ high, bands and lines widely spaced, forming a partial or complete reticulum. Pleurocystidia none; pseudocystidia filamentous, apices often crooked or forked; cheilocystidia 25-42 x 3-5 μ , cylindric to subventricose, and extending up the sides more or less 100 μ . Pileus cuticle more or less a cellular zone, bearing pileocystidia pyroform, clavate, cylindric, with a loosely interwoven, colorless subcuticular zone, pileocystidia 15-38 x 6-16 μ . Stipe cuticle a turf of brown, cylindric caulocystidia, 25-38 x 3-5 μ , with a colorless subcuticular zone; rosettes present.

LACTARIUS FUMOSUS Pk. var. FUMOSUS

Greenbush, N.Y., August.

Type

Spores yellow in deposit, 7-8.5 x 6.5-8 μ , globose or subglobose, warts 0.6-1.5 μ high, bands and a few lines forming a partial reticulum. Basidia 34-42 x 9-13(15) μ , 4-spored. Pleurocystidia none; pseudocystidia filamentous, imbedded, 3-6 μ broad; cheilocystidia 27-38 x 3-5 μ , cylindric to ventricose, at times more or less constricted. Gill trama of undulating subparallel hyphae. Pileus trama vesiculose. Pileus cuticle a turf of clavate to subventricose pileocystidia, 20-38 x 5-7 μ , arising from repent hyphae. Cuticle of stipe bearing caulocystidia, 27-32 x 2-5 μ , clavate, filamentous, subventricose, at times constricted. Clamp connections none.

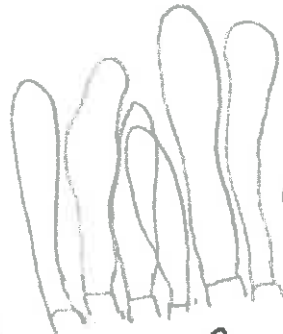
Lactarius fumosus PK. var. *fumosus*
Type



ch x 2000

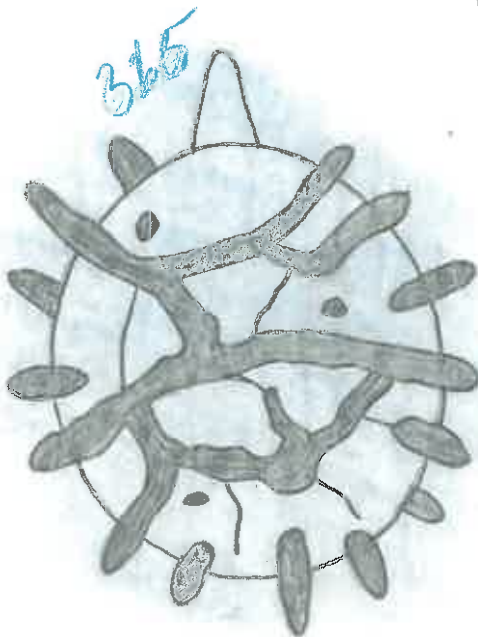


ch - x 1000

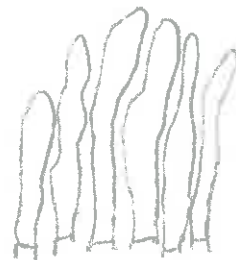


see another
sheet

Pileus hymeniform turf (cuticle)
x 1000



Spore - x 8000



Caule - x 1000

Patrick - 2089 LACTARIUS FUMOSUS var. FUMOSUS

In maple-oak woods, Oakland Co., Michigan, August 1, 1970

(Labelled fumosus var. fumosus; no notes).

Spores 7.5-8.5(9) x 7-8(9) μ , warts 1.0-2.3 μ , some partially amyloid, bands wide-spaced not forming a reticulum, webbing often observed. Pleurocystidia none; cheilocystidia 26-34 x 4-6 μ , clavate, subventricose or subfusoid. Pileus cuticle a palisade of clavate-cylindric to subventricose pileocystidia, 15-28 x 6-8 μ , arising from medium small, variable-shaped cells (no epithelium) and elongated hyphal cell-elements, below this zone another zone of colorless, interwoven, subgelatinous hyphae. Stipe cuticle of perpendicular, slender hyphae, bearing scattered caulocystidia, more or less similar to pileocystidia; rosettes present.

Micro characters compared favorably with Peck's type.

Sm-64243

LACTARIUS ~~FUMOSUS~~ var. ~~SUBALUTACEUS~~

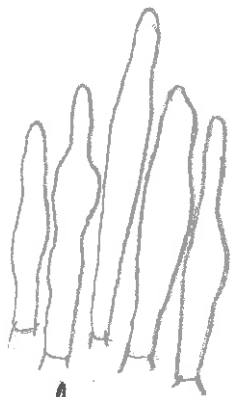
PHOTO

Haven Hill, Oakland Co., Michigan, September 14, 1961

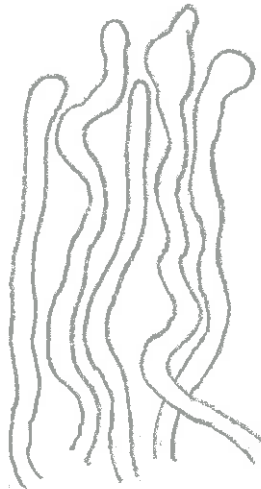
No. 10

Spores 7-9 x 6-8 μ , subglobose to broadly ellipsoid, warts 0.4-0.7 μ high, bands forming a partial reticulum, with some branches and lines. Basidia 42-50 x 9-11 μ , 2-4-spored. Pleurocystidia none; pseudocystidia filamentous, often crooked, 3-6 μ broad; cheilocystidia 28-44 x 5-7 μ , more or less ventricose. Gill trama of narrow interwoven hyphae. Pileus trama vesiculose. Pileus cuticle a turf of cylindric, clavate, or ventricose pileocystidia forming a short trichodermium, arising from a chain of 2-3 cells, which are not greatly enlarged and not forming an epithelium. Stipe cuticle a turf of caulocystidia, 25-43 x 3-5 μ , clavate, cylindric, subventricose, arising from a zone of interwoven hyphae; rosettes present. Clamp connections none.

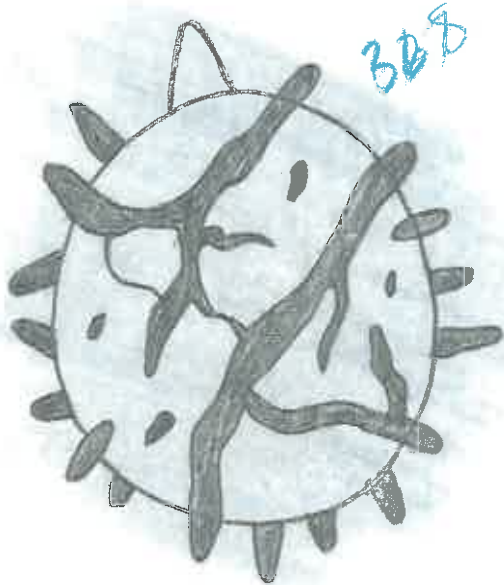
Lactarius fumosus var. ~~*subalutaceus*~~
fumosus
 Sm-64243



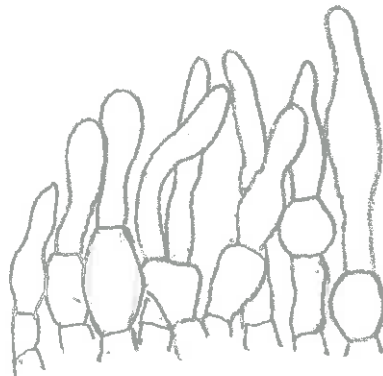
Ch - x 1000



Pseudo - x 1000



Spore - x 8000



Pileus turf - x 1000



Stipe turf
 x 1000

Bigelow 11880 *LACTARIUS FUMOSUS* var. *fumosus* ~~*SUBALUTACEUS* Sm. & Hes.~~ PHOTO
In hardwoods, Sawyer Rock, WMNF, N.H., July 20, 1963.

Notes by Bigelow

Pileus yellow-brown, nearest "antique brown." Context staining pink, taste mild. Gills close, not marginate. Spore in deposit: "yellow ocher."

Notes by Hesler

Spores 7.5-10 x 7-8.5 μ , subglobose to ellipsoid, warts 0.7-1.5 μ high, with bands and lines, not forming a reticulum, with partial webbing. Pileus cuticle as in type, pileocystidia 14-32 x 5-8 μ , clavate, cylindric, or subventricose, forming a turf on cells. Stipe cuticle of interwoven hyphae, bearing a turf of caulocystidia, 12-43 x 3-7 μ , cylindric to subventricose.

Otherwise as in Type.

35849

LACTARIUS

fumarius PK. var. *fumosus*
~~AZONITES var. AZONITES~~

Alcoa Highway, Petersen, July 14, 1971

Pileus smoky brownish to near "tawny olive." Flesh white, reddish where cut. Latex white, drying "carrot red," finally the drops fading to pallid pinkish, staining gills and context "carrot red," acrid.

Lamellae adnate, white becoming pale cream, edges concolor, close, forking behind, lamellulae numerous.

Stipe "light ochraceous buff" to "ochraceous buff," solid, equal or tapering downward slightly.

Spores in deposit yellowish to cream, $7-8.5 \times 6.5-8.5 \mu$, warts $0.4-0.8(1.0) \mu$, bands wide-spaced, forming a partial reticulum. Pleurocystidia none; cheilocystidia $30-44 \times 5-8 \mu$, subclavate, subcylindric or subventricose. Pileus cuticle 2-3 cells deep, bearing pileocystidia. Stipe cuticle of interwoven hyphae bearing scattered caulocystidia, $24-40 \times 4-7 \mu$, cylindric to clavate, often absent or few.

37279 LACTARIUS FUMOSUS var. ISABELLINUS var. nov.

On soil, deciduous-pine woods, Cades Cove, August 9, 1972

Pileus 3.5-5(6) cm broad, disc "isabella color," marginal half "cream buff," minutely velvety, depressed, even. Context white, unchanging, odor mild, taste acrid. Latex copious, acrid, white, unchanging, not staining.

Lamellae adnate, cream color, edges concolor, close to crowded, medium ~~f~~ broad, abundantly forked, short lamellulae present.

Stipe 3-4.5 cm long, 5-8 mm thick, pallid, tinged dingy cream, velvety, solid or stuffed.

Spore deposit: "light ochraceous buff;" spores 7.5-10 x 6-9 μ , ellipsoid to subglobose, warts 0.7-2.0 μ , some slender, a few slightly crooked, bands and branches forming a partial or nearly complete reticulum, with narrow webbing. Pleurocystidia none; cheilocystidia 26-38 x 3-5 μ , cylindric to subventricose, often more or less crooked. Pileus cuticle of interwoven, non-gelatinous hyphae, bearing more or less erect, clavate, ventricose, to cylindric pileocystidia which form a thin turf. Stipe cuticle similar, caulocystidia 18-40 x 3-4 μ , erect to ~~fp~~ repent, forming no turf or only a very thin turf. Clamp connections none.

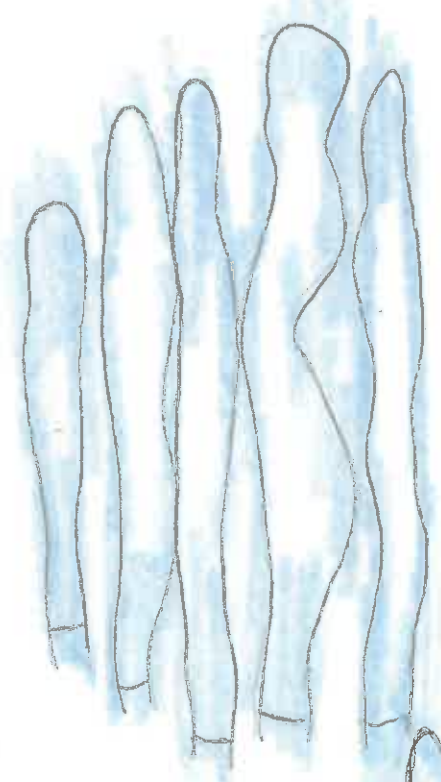
This is distinguished by the "isabella color" of the central portion of the pileus and its cream color marginal zone, its very close to crowded lamellae, its dingy cream colored stipe. It is nearest L. fumosus var. occidentalis Sm. & Hes., in which the pileus is smoky gray, its lamellae becoming subdistant, and its smoky gray stipe.

Plinthog.

Pactarius fumosus var. *isabellinus* var. nov.

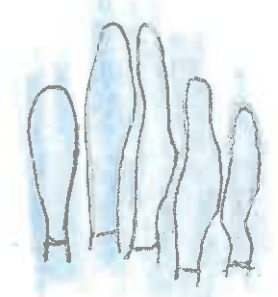
C

Term - 37279



Ch x 1000

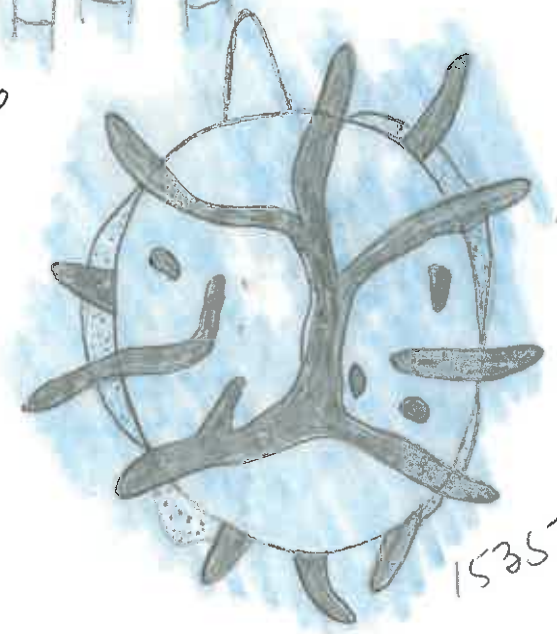
1536



1721

Pileo x 1000

ch - x 2000



1535



1722

Conulo x 1000

LACTARIUS FURCATUS Coker

Elisha Mitchell Sci. Soc. Jour. 34:18. 1918.

ILLUSTRATIONS:

Coker, Elisha Mitchell Sci. Soc. Jour. 34, pl. 14.

Pileus 6-10 cm broad, infundibuliform at maturity, margin and narrowly revolute, not striate, yellowish ochraceous, faintly many-zoned, with a short, felted tomentum, moderately viscid when wet. Context white with distinct zones of dull ochraceous, up to 7 mm thick near the stipe; odor not distinctive. Latex white, changing, after many minutes, to a distinct glaucous green, the color persisting, moderately acrid.

Lamellae fleshy-ochraceous with a tint of salmon, crowded, narrow, only 1.5-1.8 mm broad, all forking three or four times.

Stipe 2-3 cm long, about 13 mm thick, light yellowish, with small ochraceous spots, solid, firm, tough, more or less viscid.

Spores 3.5-5.5(6) x 3.5-4 μ , fleshy-ochraceous in deposit, ellipsoid to subglobose, warts very inconspicuous, short (less than 0.2 μ), often seem to be absent, a few broken medium-wide bands, occasional fine lines present. Basidia 30-36 x 5-6 μ . Pleurocystidia and cheilocystidia none found. Gill trama of short-celled hyphae. Pileus trama vesiculose, with hyphae. Pileus cuticle a zone (150-250 μ thick) of radially repent, more or less gelatinous hyphae, bearing on the surface some hyphae (tomentum); hypodermium a broad (40-65 μ), bright yellowish brown, distinct zone. Pileocystidia and caulocystidia none. Clamp connections none. Stipe cuticle more or less gelatinous zone.

HABIT, HABITAT, AND DISTRIBUTION - On soil, North Carolina, June.

MATERIAL STUDIED - NORTH CAROLINA: Coker 2232, type (NCU), on bank of New Hope Creek, near Durham Bridge, June 24, 1916.

OBSERVATIONS - This species is distinguished by its crowded much-forked lamellae, tomentose pileus, and acrid latex which becomes green. In L. lanuginosus, the pileus is zoned, viscid, and the spores are small; but the furcate lamellae and color-change in the latex of L. furcatus separate the two species.

LACTARIUS FURCATUS Coker

On soil, bank of New Hope Creek, below Chapel Hill - Durham road
bridge, leg. H. R. Totten, June 24, 1916. Photo.

TYPE (Coker-2232)

fleshy-ochraceous in deposit,
~~Spores pale cream in deposit of type collection,~~ 3.5-5.5(6) x 3.5-4 μ ,
ellipsoid, subglobose, inequilateral, warts very inconspicuous, low
(less than 0.2 μ), often seem to be absent, reticulum inconspicuous,
a few broken medium-wide bands, occasional fine lines. Basidia 30-36 x
5-6 μ . Pleurocystidia and cheilocystidia none found. Gill trama
cellular. Pileus trama vesiculose, with hyphae. Cuticle a zone (150-
250 μ thick) of radially repent, plus or minus gelatinous hyphae, bearing
some hyphae (tomentum). Hypodermium a broad (40-65 μ), bright yellowish
brown, distinct zone. Pileocystidia and caulocystidia none. Clamp
connections none. Cuticle of stipe-apex a plus or minus gelatinous zone.

Reactions to KOH and Melzer's:

	<u>Cuticle</u>	<u>Pileo</u>	<u>Ptr</u>	<u>Lact</u>	<u>Gtr</u>	<u>Hymen</u>	<u>Pl</u>	<u>Ch</u>
KOH	pallid	(0)	dingy br	y	ybr	0	-	-
Melzer	r br	(0)	pale y	y	rbr	bl br	-	-

Lactarius furcatus Coker
Type

Terminator



Spore - x 8000

Sm-78665

fuscatus
LACTARIUS ~~PSEUDO-CINEREUS~~ sp. nov.

Canyon Lake Swamp, Marquette Co., Michigan, August 29, 1970

Notes by Smith

Pileus 2.5-5 cm broad, pale drab, azonate, slimy, glabrous, margin even. Latex white, unchanging, acrid, staining gray then brown.

Lamellae decurrent, close, narrow, edges pallid, staining gray then brownish.

Stipe 5-6 cm long, 5-7 mm thick, slimy, pale drab, hollow, enlarged downward.

Spores "pinkish buff."

Notes by Hesler

Spores "pinkish buff" in deposit, 7.5-9 x 6-7 μ , warts 0.2-0.3 μ , bands and branches forming a partial reticulum. Basidia 38-50 x 8-10 μ , 4-spored. Pleurocystidia 47-68 x 7-10 μ , ventricose-acuminate, often constricted above middle; cheilocystidia 32-50 x 5-10 μ , similar. Pileus cuticle an ixotrichodermium; hypodermium pale brownish. Stipe cuticle an ixocutis; hypodermium pale brown; rosettes present.

Chief characters include the pale drab, slimy, azonate pileus; the latex unchanging but staining gray then brownish; the taste acrid. The pileus cuticle an ixotrichodermium. Spores "pinkish buff" in deposit.

It is nearest L. griseolimbatu^{sp. nov.} in which the pileus is putty colored; the latex stains gray (no brown color) and the taste mild; the gills edges often gray-marginate; the pleurocystidia much broader

Sm-78665

fuscatus
L. ~~pseudo-cinereus~~ = page 2

than in 78665; the pileus cuticle an ixocutis.

Resembles L. cinereus which has white spores, and the latex does not stain the lamellae.

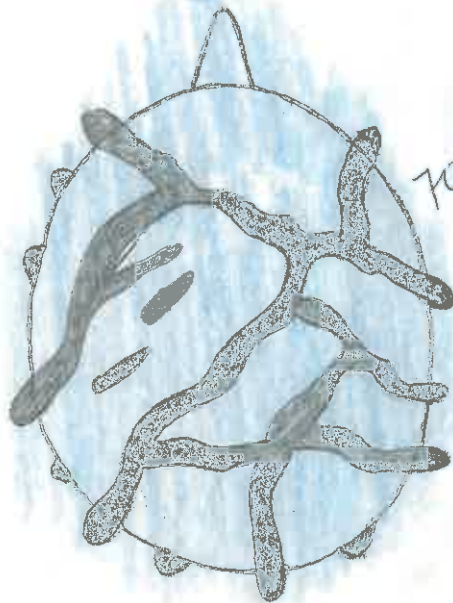
Pactarimus ~~*leguminosus*~~ ^{*psuedocinereus*} sp. nov.
 SM-78665 *fuscatus*



Pl x 1000



Ch x 1000



709

Spore x 8000

22680

fusco-olivaceus
LACTARIUS ~~ATROFUSCUS~~ sp. nov.

Type

On soil, pine woods, Cades Cove, Tennessee, October 6, 1957

Pileus 4-6 cm broad, convex, expanded, slightly depressed, "buffy brown," viscid, glabrous, azonate, margin incurved then expanded, finally short-striate. Context thick on disc, thin on margin; odor mild. Latex white, unchanging and not staining, soon moderately acrid.

Lamellae adnate to slightly subdecurrent, white, finally "light pinkish cinnamon," not staining, close to crowded, lamellulae numerous, medium broad, narrowed both ways, edges even.

Stipe 5-7 cm long, 10-12 mm thick, dingy brownish to pale cinnamon, dry, base slightly strigose, elsewhere glabrous, equal above the pointed base, hollow, not spotted.

Spores white in deposit, 8-10 x 7-8.5 μ , ellipsoid, warts 0.7-1.2 μ high, usually slender, bands forming a partial or at times a nearly complete reticulum. Basidia 34-38 x 7-9 μ , 4-spored. Pleurocystidia 45-74 x 6-10 μ , scattered, more or less fusoid, granular-spangled; cheilocystidia 26-37 x 5-7 μ , fusoid, with more or less of a neck. Gill trama of small to large celled, interwoven hyphae. Pileus trama vesiculose. Cuticle of pileus an ixocutis, resting on a ^{hyphoid} brownish hypodermium. Stipe cuticle dry, of repent hyphae; rosettes none. Clamp connections none.

This suggests L. quietus which has yellow-creamy (C) spores, and different colors of the pileus and gills.

Sactarium appalachianensis sp. nov.

22680

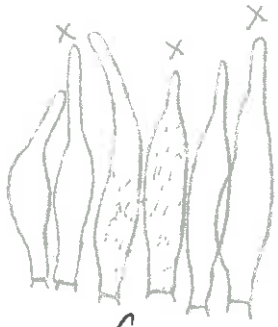
~~atrofusces~~

fusco-olivaceus sp. nov.

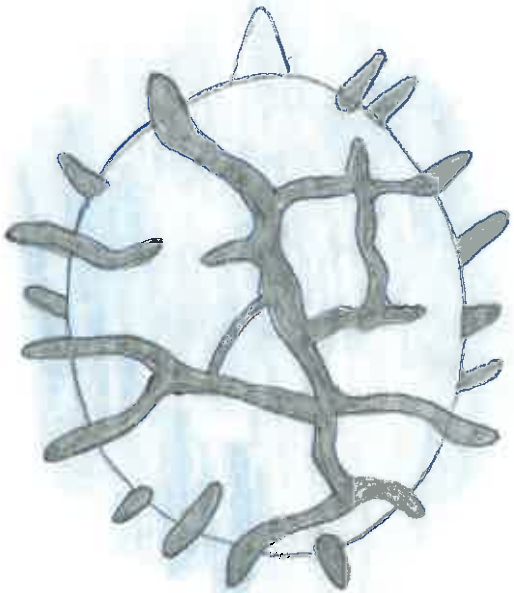
Type



Pl. x 1000



Ch. x 1000



1131

Spore - x 8000